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Technical Memorandum

To: Chinny Esakkiperumal

From: Michael Murphy **Reviewer:** Elizabeth Bowen

cc: Nelson Walter **Wood File No.:** 6107200016

Date: July 1, 2020

Re: **Documentation of Preliminary Remediation Goals (PRGs) to Address Human Health Risks in Dense Aqueous-Phase Liquid (DAPL), Groundwater Hot Spots, Upland Soil (including Containment Area soil), and Surface Water at the Olin Chemical Superfund Site**

1.0 Introduction

This technical memorandum was prepared to document the basis for human health risk-based preliminary remediation goals (PRGs) for upland soil (including Containment Area soil), and surface water in support of the on-going preparation of the Feasibility Study (FS) for Operable Unit 1 (OU1) and Operable Unit 2 (OU2) and for the Interim Action Feasibility Study (IAFS) for the Olin Chemical Superfund Site (OCSS). The PRGs were developed collaboratively between USEPA and Olin in consideration of Applicable or Relevant and Appropriate Requirements (ARARs) and human health risks identified for these media in the Baseline Human Health Risk Assessment (BHHRA) (Appendix M in the *Final Remedial Investigation Report, Operable Unit 1 & Operable Unit 2, Olin Chemical Superfund Site, Wilmington, Massachusetts* (AMEC Environment & Infrastructure, Inc. (AMEC), 2015)).

2.0 PRGs for DAPL, Groundwater Hot Spots, and Residential Scenarios

As part of development of a Proposed Plan for the OCSS, the USEPA developed the attached Summary Table summarizing PRGs, exposure pathways, and maximum exposure scenarios. As noted on the table, PRGs are not applicable for Dense Aqueous Phase Liquids (DAPL) and groundwater hots spots because the interim remedial actions being developed for the site are based on mass removal and prevention of residential use rather than risk-based endpoints. In addition, PRGs were not developed for constituents in upland soils because institutional controls will be used to prevent potential residential exposure, and because there were no unacceptable risks for outdoor workers or construction workers.

3.0 Upland Soils PRGs

Three separate human health exposure scenarios for upland soils are discussed in the following subsections. These discussions focus on human health risks associated with soil exposure for hypothetical future residential use of the property, future industrial/commercial worker and construction worker soil exposure for the Containment Area, and industrial/commercial worker and other potential building occupants' exposure to TMPs in the indoor air of future buildings.

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3.1 Site-wide soil – Future Residential Use – direct contact

The BHHRA developed as part of the 2015 OU1/OU2 RI Report (AMEC, 2015) included an evaluation of human health risks for direct exposure (ingestion, dermal contact, and inhalation of dust) to upland soils for industrial/commercial workers and future construction workers. The 2015 BHHRA calculated cancer risks were within the CERCLA risk range and the HIs were below 1.0. There is no intention to use the Site for residential purposes, so risk assessment assuming residential use was not conducted.

USEPA conducted a conservative human health risk evaluation for upland soil and hypothetical future residential land use. The calculated cancer risk was 4.1×10^{-3} and the corresponding HI was 31. However, as mentioned above, the Site will be restricted to industrial/commercial use only, so no active remedial alternatives have been evaluated to address these potential future residential human health risks. Institutional Controls are included in the active site-wide soil alternatives to prevent future residential use. Therefore, no human health PRGs are necessary to support the OU1/OU2 FS.

3.2 Containment Area Soils – Future Industrial/Commercial Worker and Construction Worker

The 2015 BHHRA evaluated surface soil potential risks for the Containment Area for the future construction workers and trespassers. Calculated cancer risks were within the CERCLA risk range and the HIs were below 1.0. Risks for exposure to Containment Area subsurface soils were not evaluated in the 2015 BHHRA as there were limited data available.

Olin conducted a soil sampling program for the Containment Area in Fall 2019 to gain a better understanding of the environmental condition of surface and subsurface soils. A human health risk evaluation for industrial/commercial workers and future construction workers was conducted in 2020 using the most recent data for the Containment Area (the Fall 2019 data and 2009 RI data). The risk evaluation was performed consistently with the technical approach used in the 2015 BHHRA. The risk evaluation included compilation and summarization of the data, selection of chemicals of potential concern (COPCs), exposure assessment (including identification of exposure parameters and calculation of exposure point concentrations), identification of appropriate toxicity values for use in risk calculations, and calculation of cancer risks and HIs for each receptor/soil depth interval combination. The risk evaluation is documented in **Appendix A** and the risk evaluation results are summarized in **Table 5** of **Appendix A**.

The cancer risks and HIs for the industrial/commercial worker exposed to soil 0-2 ft bgs (8×10^{-6}, HI = 0.03) and 2-10 ft bgs (9 x 10-6, HI = 0.03) and the future construction worker exposed to soil 0-10 ft bgs (1×10^{-6}, HI = 0.01) were within the CERCLA cancer risk range and below an HI of 1.0, respectively. Therefore, based on the 2015 BHHRA results for upland soil and the 2020 human health risk evaluation for soils within the Containment Area, soil exposure cancer risk and HIs for industrial/commercial workers, trespassers, and future construction workers meet CERCLA risk limits. Therefore, human health risk-based PRGs for direct exposure to soils (ingestion, dermal contact, and inhalation of dust) for current and future industrial/commercial land use are not necessary to support the IAFS.

3.3 Human Health Risk-Based Vapor Intrusion PRGs for TMPs In Indoor Air and Subsurface Soil

TMPs were detected in soil samples at elevated concentrations in and near some of the developed areas of the site. There are currently no occupied buildings in areas where TMPs were detected in subsurface soils, therefore there is not a complete vapor intrusion (VI) pathway under current site conditions. However, there is the potential for VI into future occupied buildings and the potential for construction worker inhalation exposure during future construction activities in those areas.

To address potential future human health risks industrial/commercial indoor air, PRGs for TMPs were calculated as described below.

The human health indoor air PRGs for TMPs were developed using USEPA toxicity information and commercial/industrial worker exposure assumptions. TMPs are not classified as carcinogens by USEPA. Therefore, the indoor air PRGs were developed based on toxicity information for non-cancer effects.
The November 2019 USEPA Regional Screening Levels (RSLs) Table for Industrial Soil (USEPA, 2019) lists an oral non-cancer Reference Dose (RfD) of 0.01 mg/kg/day for 2,4,4-trimethylpentene (CAS# 25167-70-8) but the RSL tables do not list an Inhalation Reference Concentration (RfC) for TMPs. This suggests that sufficient, definitive inhalation toxicity information is not available for deriving an air concentration that would be without appreciable risk of adverse effects for long-term exposure. An often-used and widely recognized approach, route-to-route extrapolation was employed to estimate a concentration analogous to an Inhalation RfC. The underlying assumption of the approach is that a "safe" dose for oral exposure, expressed as mg/kg/day, can be assumed to be a "safe" dose for inhalation exposure. Using this approach, an air concentration can be calculated using standard inhalation exposure assumptions and bodyweights that would yield a dose equal to the Oral RfD. That estimated air concentration for continuous long-term exposure is 0.04 mg/m^3. That number was then converted using standard industrial/commercial worker exposure parameters to derive industrial/commercial indoor air PRGs at Hazard Quotients (HQ) of 1 and 0.1.

The PRGs were developed for a commercial/industrial indoor worker being on-site 8 hours per day for 250 days per year. The calculated indoor air PRGs for TMPs, based on target HQs of 1 and 0.1 are summarized below. PRGs are typically calculated for target levels of 1 and 0.1 to be able to address scenarios with multiple COCs and RAOs that call for a cumulative hazard index (sum of HQs) of one or less.

Commercial/Industrial Indoor Air PRG for TMPs in Soil at BHHRA EA1, EA3, and EA7

For Target HQ = 1	Total TMPs PRG = 0.175 mg/m^3
For Target HQ = 0.1	Total TMPs PRG = 0.0175 mg/m^3

It is not possible to predict if a future VI pathway from soils to indoor air would be complete and whether indoor air PRGs would be exceeded without knowledge of a future building's design, construction methods, materials, and location. In addition, modeling a soil concentration that would not cause indoor air issues through VI would have significant uncertainties as there are many factors that affect movement through soils and into buildings. Potential VI risks may be addressed by preventing vapor intrusion into a building, or by removing and/or treating soil with elevated TMP concentrations.

In the absence of a VI related soil PRG, a surrogate Industrial Soil Direct Contact RSL of 39 mg/kg was calculated in the 2015 BHHRA and was used in the OU1/OU2 FS for the purposes of estimating areas and volumes of soil to be addressed in active remedial alternatives. The full extent of areas where a TMP remedy is required will be determined based on pre-design investigations.

4.0 Off-Property West Ditch Stream Surface Water PRGs

The 2015 BHHRA concluded that the cancer risk for the trespasser exposed to COPCs in sediment and surface water in the off-Property West Ditch (off-PWD) is above the CERCLA acceptable risk range. The main risk contributor for the receptor is the combined ingestion and dermal exposure to surface water for benzo(a)pyrene (B(a)P). The combined ingestion and dermal cancer risk for B(a)P in surface water for the trespasser (adolescent trespasser (1.7×10^{-4}) and adult trespasser (8.1×10^{-5})) is 2.51×10^{-4}. The B(a)P exposure point concentration in surface water of the off-PWD was 2.3 µg/L. The cumulative (all COPCs) surface water HIs for the adolescent trespasser (0.1) and for the adult trespasser (0.1) were both well below 1. Therefore, a cancer risk-based PRG is calculated based on the B(a)P surface water exposure point concentration, calculated cancer risk, and the target

cancer risk of 1 x 10^{-4} as shown below. The PRGs at target cancer risks of 1 x 10^{-5} and 1 x 10^{-6} would be ten-fold and 100-fold multiples of the PRG calculated below.

$$\frac{Exposure\ Point\ Concentration}{Calculated\ Cancer\ Risk} = \frac{PRG}{Target\ Cancer\ Risk} \quad (1)$$

$$\frac{2.3\ \mu g/L}{2.51\ x\ 10^{-4}} = \frac{PRG\ \mu g/L}{1\ x\ 10^{-4}} \quad (2)$$

$$PRG\ \ \mu g/L = \frac{(2.3 \mu g/L)(1\ x\ 10^{-4})}{(2.51\ x\ 10^{-4})} = 0.9\ \ \mu g/L \quad (3)$$

The cancer risk-based B(a)P surface water PRG at target cancer risk of 1 x 10^{-4} is 0.9 µg/L.

The 2015 OU1/OU2 RI Report and BHHRA indicate multiple possible off-Property sources of B(a)P and other PAHs in Off-PWD surface water including stormwater runoff from parking lots adjacent to Jewel Drive, creosote-treated railroad ties at the rail lines (owned by Pan Am Railway) between OCSS and the Off-Property West Ditch, and stormwater runoff from roadways.

The attached Summary Table summarizes Human Health Risk PRGs based on the evaluation above.

5.0 References

AMEC Environment & Infrastructure, Inc. (AMEC), 2015. *Final Remedial Investigation Report, Operable Unit 1 & Operable Unit 2, Olin Chemical Superfund Site, Wilmington, Massachusetts*, July.

Wood Environment & Infrastructure Solutions, 2019. *Revised Draft Baseline Human Health Risk Assessment Operable Unit 3, June*.

Sincerely,

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Attachments:

Summary Table – Preliminary Remediation Goals (PRGs) to Address Human Health Risks
Appendix A – Human Health Risk Evaluation, Containment Area Soil

SUMMARY TABLE

Summary Table Preliminary Remediation Goals (PRGs) to Address Human Health Risks				
Chemical of Concern (COC)	**Selected PRG**	**Receptor (Exposure Pathway)**	**Notes**	**Human Health Reasonable Maximum Exposure Scenario Receptor Risk and Hazard Index**
Dense Aqueous-Phase Liquid (DAPL)				
NDMA	N/A (1)	Resident (Ingestion, Dermal Contact, Inhalation During Showering)	No MCL	CR = 3×10^{-2} HI = 3,379
Groundwater Hot Spots				
NDMA	N/A (2)	Resident (Ingestion, Dermal Contact, Inhalation During Showering)	No MCL	CR = 3×10^{-2} HI = 291
Upland Soil*				
Metals, benzo(a)pyrene	N/A (2)	Future On-Property Resident (Ingestion, Dermal Contact, Inhalation of Airborne Dust)	Data obtained from surface soil	CR = 4.1×10^{-3} HI = 31
			Data obtained from subsurface soil	CR = 7.0×10^{-4} HI = 203
Risks and HI meet CERCLA limits. Therefore no COCs or PRGs are identified.	N/A (3,4)	Future Construction Worker (Ingestion, Dermal Contact, Inhalation of Airborne Dust)	Data obtained from Containment Area soil	(CR = 1×10^{-6} HI = 0.01 (4)
Risks and HI meet CERCLA limits. Therefore no COCs or PRGs are identified.	N/A (3,4)	Future Outdoor Worker (Ingestion, Dermal Contact) Surface Soil/Subsurface Soil	Data obtained from Containment Area soil	CR = 8×10^{-6}, HI = 0.03 CR = 9×10^{-6}, HI = 0.03
TMPs (5)	Total TMPs Indoor Air PRG = 0.175 mg/m^3	Future Indoor Worker or Building Occupant (Inhalation of Indoor Air - Vapor Intrusion from Subsurface Soil)	Vapor intrusion risks not quantified in HHRA (5). Total TMPs Indoor Air PRG = 0.175 mg/m^3	
Surface Water				
Benzo(a)pyrene	0.9 µg/L (6)	Trespasser in Off-Property West Ditch Stream (Ingestion & Dermal Contact)	Surface water samples collected from the off-Property portion of West Ditch Stream	CR = 5×10^{-4} HI = 0.2

Acronyms

BEHP bis-2-ethylhexylphthalate
BMPs Best Management Practices
CA Containment Area
CR Excess Lifetime Cancer Risk

HHRA	Human Health Risk Assessment
HI	Hazard Index
ICs	Institutional Controls
MCL	Maximum Contaminant Limit
N/A	Not Applicable
NDMA	n-nitrosodimethylamine
PRG	Preliminary Remediation Goal
TMPs	trimethylpentenes
UCL	Upper Confidence Limit

Notes

(1) Interim remedy focused on mass removal

(2) ICs to prevent residential use

(3) ICs to require BMPs to prevent unacceptable exposures

(4) Risks for the construction worker and outdoor worker calculated using the lower of the maximum detected concentration and the 95% Upper Confidence Limit on the mean concentration for each Chemical of Potential Concern (COPC).

(5) Vapor intrusion risks only qualitatively evaluated in the HHRA for upland soil because currently there are no occupied buildings on-site

(6) PRG set at target CR = 1×10^{-4}.

*The term *upland soil* includes Containment Area soil

Appendix A

Human Health Risk Evaluation
Containment Area Soil

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Selection of Chemicals of Potential Concern - Containment Area Soil (0-2 ft)
Human Health Risk Assessment
Olin Chemical Superfund Site
Wilmington, Massachusetts

CAS Number	Chemical	Minimum (1) Concentration	Maximum (1) Concentration	Units	Location of Maximum Concentration	Frequency of Detection	Range of Reporting Limits for Non Detects	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (4)	Potential ARAR/TBC Value (5)	Potential ARAR/TBC Source	Retain as COPC? (6)	Rationale for Contaminant Deletion or Selection
	Volatile Organics													
120-82-1	1,2,4-Trichlorobenzene	0.0025	0.0025	MG/KG	OC-SB-707-0.0/2.0-XXX	1 / 21	0.0023 - 0.0073	0.0025	NA	26 n			No	BSL
95-63-6	1,2,4-Trimethylbenzene	0.003	0.003	MG/KG	OC-SB-704-0.0/2.0-XXX	1 / 21	0.0023 - 0.0064	0.003	NA	180 n			No	BSL
108-67-8	1,3,5-Trimethylbenzene	0.00063	0.0014	MG/KG	OC-SB-704-0.0/2.0-XXX	2 / 21	0.0023 - 0.0059	0.0014	NA	150 n			No	BSL
107-39-1	2,4,4-Trimethyl-1-pentene	0.0009	0.0051	MG/KG	OC-SB-704-0.0/2.0-XXX	4 / 21	0.0042 - 0.0065	0.0051	NA	1200 ns			No	BSL
107-40-4	2,4,4-Trimethyl-2-pentene	0.00088	0.0013	MG/KG	OC-SB-711-0.0/2.0-XXX	2 / 21	0.0042 - 0.0073	0.0013	NA	1200 ns			No	BSL
78-93-3	2-Butanone	0.0066	0.017	MG/KG	OC-SB-704-0.0/2.0-XXX	3 / 21	0.021 - 0.033	0.017	NA	19000 n			No	BSL
99-87-6	4-iso-Propyltoluene	0.0013	0.0019	MG/KG	OC-SB-704-0.0/2.0-XXX	2 / 21	0.0023 - 0.0059	0.0019	NA				Yes	NSL
67-64-1	Acetone	0.0058	0.093	MG/KG	OC-SB-704-0.0/2.0-XXX	7 / 21	0.23 - 0.33	0.093	NA	67000 n			No	BSL
75-15-0	Carbon disulfide	0.0039	0.0039	MG/KG	OC-SB-708-0.0/2.0-XXX	1 / 21	0.0023 - 0.0073	0.0039	NA	350 n			No	BSL
60-29-7	Diethyl ether	0.0034	0.0034	MG/KG	OC-SB-704-0.0/2.0-XXX	1 / 21	0.0023 - 0.0064	0.0034	NA	23000 ns			No	BSL
100-41-4	Ethylbenzene	0.00042	0.00042	MG/KG	OC-SB-709-0.0/2.0-XXX	1 / 21	0.0023 - 0.0073	0.00042	NA	25 c*			No	BSL
91-20-3	Naphthalene	0.0011	0.0025	MG/KG	OC-SB-704-0.0/2.0-XXX	2 / 21	0.021 - 0.033	0.0025	NA	8.6 c**			No	BSL
108-88-3	Toluene	0.00061	0.0014	MG/KG	OC-SB-704-0.0/2.0-XXX	2 / 21	0.0023 - 0.0059	0.0014	NA	4700 ns			No	BSL
1330-20-7	Xylenes, Total	0.0014	0.0014	MG/KG	OC-SB-709-0.0/2.0-XXX	1 / 21	0.0042 - 0.0073	0.0014	NA	250 n			No	BSL
	Semivolatile Organics													
120-82-1	1,2,4-Trichlorobenzene	0.0022	0.068	MG/KG	OC-SB-707-0.0/2.0-XXX	5 / 21	0.036 - 0.2	0.068	NA	26 n			No	BSL
90-12-0	1-Methylnaphthalene	0.0084	0.023	MG/KG	OC-SB-704-0.0/2.0-XXX	2 / 21	0.0072 - 0.044	0.023	NA	73 c*			No	BSL
91-57-6	2-Methylnaphthalene	0.01	0.037	MG/KG	OC-SB-704-0.0/2.0-XXX	2 / 21	0.0072 - 0.044	0.037	NA	300 n			No	BSL
7005-72-3	4-Chlorophenyl phenyl ether	0.031	0.031	MG/KG	OC-SB-704-0.0/2.0-XXX	1 / 21	0.036 - 0.2	0.031	NA				Yes	NSL
83-32-9	Acenaphthene	0.016	0.016	MG/KG	OC-SB-704-0.0/2.0-XXX	1 / 21	0.0072 - 0.044	0.016	NA	4500 n			No	BSL
208-96-8	Acenaphthylene	0.0016	0.003	MG/KG	OC-SB-703-0.0/2.0-XXX	3 / 21	0.0077 - 0.044	0.003	NA	2300 n			No	BSL
98-86-2	Acetophenone	0.0034	0.0044	MG/KG	OC-SB-706-0.0/2.0-XXX	3 / 21	0.036 - 0.4	0.0044	NA	12000 ns			No	BSL
120-12-7	Anthracene	0.0026	0.0091	MG/KG	OC-SB-704-0.0/2.0-XXX	4 / 21	0.0077 - 0.044	0.0091	NA	23000 n			No	BSL
100-52-7	Benzaldehyde	0.01	0.06	MG/KG	OC-SS-430-0.0/1.0-XXX	4 / 21	0.036 - 0.4	0.06	NA	820 c*			No	BSL
56-55-3	Benzo(a)anthracene	0.003	0.022	MG/KG	OC-SB-711-0.0/2.0-XXX	12 / 21	0.0082 - 0.042	0.022	NA	21 c			No	BSL
50-32-8	Benzo(a)pyrene	0.0026	0.017	MG/KG	OC-SS-430-0.0/1.0-XXX	12 / 21	0.0082 - 0.042	0.017	NA	2.1 c*			No	BSL
205-99-2	Benzo(b)fluoranthene	0.0031	0.027	MG/KG	OC-SS-430-0.0/1.0-XXX	13 / 21	0.0082 - 0.042	0.027	NA	21 c			No	BSL
191-24-2	Benzo(ghi)perylene	0.0018	0.016	MG/KG	OC-SB-707-0.0/2.0-XXX	9 / 21	0.0082 - 0.044	0.016	NA	2300 n			No	BSL
207-08-9	Benzo(k)fluoranthene	0.0031	0.0088	MG/KG	OC-SB-711-0.0/2.0-XXX	6 / 21	0.0078 - 0.044	0.0088	NA	210 c			No	BSL
92-52-4	Biphenyl	0.0026	0.024	MG/KG	OC-SB-704-0.0/2.0-XXX	8 / 21	0.036 - 0.044	0.024	NA	20 n			No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.11	8.1	MG/KG	OC-SB-707-0.0/2.0-XXX	21 / 21	- - -	8.1	NA	160 c*			No	BSL
86-74-8	Carbazole	0.0019	0.0035	MG/KG	OC-SB-711-0.0/2.0-XXX	2 / 21	0.0077 - 0.044	0.0035	NA				Yes	NSL
218-01-9	Chrysene	0.0028	0.027	MG/KG	OC-SB-711-0.0/2.0-XXX	13 / 21	0.0082 - 0.042	0.027	NA	2100 c			No	BSL
53-70-3	Dibenz(a,h)anthracene	0.0021	0.0034	MG/KG	OC-SB-702-0.0/2.0-XXX	5 / 21	0.008 - 0.044	0.0034	NA	2.1 c			No	BSL
132-64-9	Dibenofuran	0.0088	0.0088	MG/KG	OC-SB-704-0.0/2.0-XXX	1 / 21	0.036 - 0.2	0.0088	NA	120 n			No	BSL
84-74-2	Di-n-butylphthalate	0.018	0.021	MG/KG	OC-SB-711-0.0/2.0-XXX	2 / 21	0.036 - 0.2	0.021	NA	8200 n			No	BSL
117-84-0	Di-n-octylphthalate	0.061	0.061	MG/KG	OC-SB-709-0.0/2.0-XXX	1 / 21	0.036 - 0.2	0.061	NA	820 n			No	BSL
101-84-8	Diphenyl ether	0.015	0.015	MG/KG	OC-SS-421-0.0/1.0-XXX	2 / 10	0.036 - 0.044	0.015	NA	14 n			No	BSL
122-39-4	Diphenylamine	0.014	0.02	MG/KG	OC-SS-431-0.0/1.0-XXX	2 / 5	0.038 - 0.039	0.02	NA	8200 n			No	BSL
206-44-0	Fluoranthene	0.0035	0.047	MG/KG	OC-SB-704-0.0/2.0-XXX	18 / 21	0.038 - 0.04	0.047	NA	3000 n			No	BSL
86-73-7	Fluorene	0.02	0.022	MG/KG	OC-SS-431-0.0/1.0-XXX	3 / 21	0.0072 - 0.044	0.022	NA	3000 n			No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.0017	0.017	MG/KG	OC-SB-707-0.0/2.0-XXX	9 / 21	0.0082 - 0.044	0.017	NA	21 c			No	BSL
91-20-3	Naphthalene	0.0025	0.015	MG/KG	OC-SB-704-0.0/2.0-XXX	8 / 21	0.0077 - 0.11	0.015	NA	8.6 c**			No	BSL
86-30-6	N-Nitrosodiphenylamine	0.012	0.51	MG/KG	OC-SB-707-0.0/2.0-XXX	17 / 22	0.038 - 0.2	0.51	NA	470 c			No	BSL
85-01-8	Phenanthrene	0.0024	0.084	MG/KG	OC-SB-704-0.0/2.0-XXX	11 / 21	0.04 - 0.05	0.084	NA	2300 n			No	BSL
108-95-2	Phenol	0.013	0.33	MG/KG	OC-SB-704-0.0/2.0-XXX	3 / 21	0.036 - 0.2	0.33	NA	25000 n			No	BSL
129-00-0	Pyrene	0.0042	0.047	MG/KG	OC-SS-429-0.0/1.0-XXX	15 / 21	0.0082 - 0.04	0.047	NA	2300 n			No	BSL

Table 1
Selection of Chemicals of Potential Concern - Containment Area Soil (0-2 ft)
Human Health Risk Assessment
Olin Chemical Superfund Site
Wilmington, Massachusetts

CAS Number	Chemical	Minimum (1) Concentration	Maximum (1) Concentration	Units	Location of Maximum Concentration	Frequency of Detection	Range of Reporting Limits for Non Detects	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (4)	Potential ARAR/TBC Value (5)	Potential ARAR/TBC Source	Retain as COPC? (6)	Rationale for Contaminant Deletion or Selection
	Metals & Inorganics													
7429-90-5	Aluminum	5000	9900	MG/KG	OC-SB-701-0.0/2.0-XXX	21 / 21	- - -	9900	16279	110000 nm			No	BSL
7440-36-0	Antimony	0.63	1	MG/KG	OC-SB-707-0.0/2.0-XXX	5 / 21	0.57 - 20	1	ND	47 n			No	BSL
7440-38-2	Arsenic	3.8	33	MG/KG	OC-SB-707-0.0/2.0-XXX	21 / 21	- - -	33	11.7	3 c*R			Yes	ASL
7440-39-3	Barium	12	89	MG/KG	OC-SB-703-0.0/2.0-XXX	21 / 21	- - -	89	17.7	22000 n			No	BSL
7440-41-7	Beryllium	0.24	0.5	MG/KG	OC-SB-702-0.0/2.0-XXX	21 / 21	- - -	0.5	0.40	230 n			No	BSL
7440-43-9	Cadmium	0.035	0.92	MG/KG	OC-SS-430-0.0/1.0-XXX	21 / 21	- - -	0.92	0.32	98 n			No	BSL
7440-70-2	Calcium	1200	110000	MG/KG	OC-SB-704-0.0/2.0-XXX	21 / 21	- - -	110000	680				No	E
7440-47-3	Chromium	13	180	MG/KG	OC-SB-703-0.0/2.0-XXX	21 / 21	- - -	180	12.8	180000 nm			No	BSL
18540-29-9	Chromium, Hexavalent	0.95	5.8	MG/KG	OC-SB-703-0.0/2.0-XXX	10 / 11	0.46 - 0.46	5.8	NA	6.3 c*			No	BSL
7440-48-4	Cobalt	1.9	5.8	MG/KG	OC-SB-708-0.0/2.0-XXX	21 / 21	- - -	5.8	3.4	35 n			No	BSL
7440-50-8	Copper	4.5	11	MG/KG	OC-SB-707-0.0/2.0-XXX	21 / 21	- - -	11	6.7	4700 n			No	BSL
7439-89-6	Iron	6400	20000	MG/KG	OC-SS-430-0.0/1.0-XXX	21 / 21	- - -	20000	15564	82000 n			No	BSL
7439-92-1	Lead	3.9	12	MG/KG	OC-SB-702-0.0/2.0-XXX	21 / 21	- - -	12	28	800 G			No	BSL
7439-95-4	Magnesium	1600	4000	MG/KG	OC-SB-702-0.0/2.0-XXX	21 / 21	- - -	4000	1215				No	E
7439-96-5	Manganese	83	370	MG/KG	OC-SS-430-0.0/1.0-XXX	21 / 21	- - -	370	75	2600 n			No	BSL
7439-97-6	Mercury	0.011	0.048	MG/KG	OC-SB-712-0.0/2.0-XXX	11 / 21	0.022 - 0.21	0.048	0.12	4.6 ns			No	BSL
7440-02-0	Nickel	6.1	18	MG/KG	OC-SB-708-0.0/2.0-XXX	21 / 21	- - -	18	8.4	3.6 c			Yes	ASL
7440-02-0	Potassium	6.1	18	MG/KG	OC-SB-708-0.0/2.0-XXX	21 / 21	- - -	18	682	3.6 c			No	E
7782-49-2	Selenium	0.52	1.1	MG/KG	OC-SB-711-0.0/2.0-XXX	3 / 21	0.57 - 5.3	1.1	0.70	580 n			No	BSL
7440-22-4	Silver	0.13	1.2	MG/KG	OC-SS-429-0.0/1.0-XXX	10 / 21	0.63 - 0.8	1.2	ND	580 n			No	BSL
7440-23-5	Sodium	46	440	MG/KG	OC-SB-709-0.0/2.0-XXX	20 / 21	170 - 170	440	50				No	E
7440-31-5	Tin	0.52	36	MG/KG	OC-SS-429-0.0/1.0-XXX	20 / 21	2.5 - 2.5	36	4.4	70000 n			No	BSL
7440-62-2	Vanadium	9.3	25	MG/KG	OC-SB-702-0.0/2.0-XXX	21 / 21	- - -	25	25	580 n			No	BSL
7440-66-6	Zinc	11	30	MG/KG	OC-SB-702-0.0/2.0-XXX	21 / 21	- - -	30	19.6	35000 n			No	BSL
7664-41-7	Ammonia, Nitrogen	3.8	39	MG/KG	OC-SS-430-0.0/1.0-XXX	14 / 21	6.5 - 8.4	39					Yes	NSL
16887-00-6	Chloride	4.7	44	MG/KG	OC-SS-422-0.0/1.0-XXX	5 / 21	11 - 25	44	NA				Yes	NSL
14808-79-8	Sulfate	57	18000	MG/KG	OC-SB-703-0.0/2.0-XXX	21 / 21	- - -	18000	NA				Yes	NSL
	Specialty Compounds													
50-00-0	Formaldehyde	0.096	3.2	MG/KG	OC-SB-707-0.0/2.0-XXX	6 / 16	0.11 - 2.5	3.2	NA	50 c**			No	BSL
302-01-2	Hydrazine	0.00062	0.086	MG/KG	OC-SB-704-0.0/2.0-XXX	10 / 16	0.0023 - 0.0067	0.086	NA	0.14 c**			No	BSL

Prepared by / Date: CF 5/27/2020
Checked by / Date: MJM 06/01/2020

(1) Minimum or maximum concentration detected in data set. Samples included in data set are identified in Attachment A.
(2) The concentration used for screening is the maximum detected concentration.
(3) Background value is the site specific background upper prediction limit concentration.
(4) Values are the Regional Screening Levels (RSLs) obtained from USEPA May 2020.
Values used for screening are the industrial soil RSLs (the lesser of the concentrations associated with cancer risk equal to 1E-06 and non-cancer hazard quotient of 0.1).
RSL for 2,4,4-Trimethylpentene used for 2,4,4-Trimethyl-1-pentene and 2,4,4-Trimethyl-2-pentene
RSL for Chromium (III), Insoluble Salts used for Chromium
RSL for pyrene used for phenanthrene, acenaphthylene, benzo(ghi)perylene.
RSL for Manganese (non-diet) used for Manganese.
n - RSL is based on a non-cancer hazard quotient of 0.1.
c - RSL is based on an excess lifetime cancer risk of 1 in 1 million.
c* - where n RSL < 100X c RSL.
n[a] - Value is based on a non-cancer endpoint because RSL at a hazard index of 0.1 is lower than RSL at cancer risk equal to 1E-06.
ns - RSL is based on a non-cancer hazard quotient of 0.1; concentration may exceed Csat.
nm - RSL is based on a non-cancer hazard quotient of 0.1; concentration may exceed ceiling limit.
G - see user guide on lead.
R - Relative bioavailability factor applied.
Values for EPH and VPH fractions are the MCP S-2 values for non-cancer risks equal to a hazard index of 0.2.
(5) There are no Applicable or Relevant and Appropriate Requirements / To Be Considered (ARAR/TBC) for soil.
(6) Analyte is selected as a COPC if the concentration used for screening exceeds the RSL or if no screening value is available.
ASL - Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
BSL - Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
NSL - No screening level available; the anlayte was selected as a COPC.
E - Compound is an essential nutrient.
mg/Kg - milligrams per kilogram.
COPC - Chemical of potential concern.
ND - Not detected
NA - Not analyzed

Table 2
Selection of Chemicals of Potential Concern - Containment Area Soil (2-10 ft)
Human Health Risk Assessment
Olin Chemical Superfund Site
Wilmington, Massachusetts

CAS Number	Chemical	Minimum (1) Concentration	Maximum (1) Concentration	Units	Location of Maximum Concentration	Frequency of Detection	Range of Reporting Limits for Non Detects	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (4)	Potential ARAR/TBC Value (5)	Potential ARAR/TBC Source	Retain as COPC? (6)	Rationale for Contaminant Deletion or Selection
	Volatile Organics													
75-34-3	1,1-Dichloroethane	0.0007	0.00083	MG/KG	OC-SB-707-2.0/4.0-XXX	2 / 47	0.0037 - 1.9	0.00083	NA	16 c			No	BSL
120-82-1	1,2,4-Trichlorobenzene	0.00036	0.0019	MG/KG	OC-SB-709-2.0/4.0-XXX	9 / 47	0.0037 - 1.9	0.0019	NA	26 n			No	BSL
95-63-6	1,2,4-Trimethylbenzene	0.0027	0.016	MG/KG	OC-SB-701-4_0/6_0-XXX	3 / 47	0.0037 - 1.9	0.016	NA	180 n			No	BSL
108-67-8	1,3,5-Trimethylbenzene	0.00037	0.0011	MG/KG	OC-SB-701-4_0/6_0-XXX	4 / 47	0.0037 - 1.9	0.0011	NA	150 n			No	BSL
541-73-1	1,3-Dichlorobenzene	0.00032	0.00035	MG/KG	OC-SB-710-4.0/6.0-XXX	2 / 47	0.0037 - 1.9	0.00035	NA	11 c			No	BSL
107-39-1	2,4,4-Trimethyl-1-pentene	0.00076	8	MG/KG	OC-SB-711-4.0/6.0-XXX	32 / 47	0.0037 - 1.2	8	NA	1200 ns			No	BSL
107-40-4	2,4,4-Trimethyl-2-pentene	0.00056	6.3	MG/KG	OC-SB-711-4.0/6.0-XXX	25 / 47	0.0037 - 1.2	6.3	NA	1200 ns			No	BSL
78-93-3	2-Butanone	0.0044	0.56	MG/KG	OC-SB-705-6.0/8.0-XXX	23 / 47	0.018 - 9.3	0.56	NA	19000 n			No	BSL
99-87-6	4-iso-Propyltoluene	0.00041	0.42	MG/KG	OC-SB-711-4.0/6.0-XXX	6 / 47	0.0037 - 1.9	0.42	NA				Yes	NSL
79-20-9	Acetic acid, methyl ester	0.0063	0.33	MG/KG	OC-SB-711-4.0/6.0-XXX	4 / 47	0.037 - 19	0.33	NA	120000 nms			No	BSL
67-64-1	Acetone	0.0042	0.099	MG/KG	OC-SB-701-4.0/6.0-XXX	31 / 47	0.19 - 93	0.099	NA	67000 n			No	BSL
71-43-2	Benzene	0.0002	0.00082	MG/KG	OC-SB-701-4.0/6.0-XXX	5 / 47	0.0037 - 1.9	0.00082	NA	5.1 c**			No	BSL
75-15-0	Carbon disulfide	0.0024	0.0066	MG/KG	OC-SB-701-4.0/6.0-XXX	9 / 47	0.0037 - 1.9	0.0066	NA	350 n			No	BSL
60-29-7	Diethyl ether	0.0028	0.0028	MG/KG	OC-SB-704-2.0/4.0-XXX	1 / 47	0.0037 - 1.9	0.0028	NA	23000 ns			No	BSL
100-41-4	Ethylbenzene	0.00027	0.37	MG/KG	OC-SB-711-4.0/6.0-XXX	6 / 47	0.0037 - 1.9	0.37	NA	25 c*			No	BSL
98-82-8	Isopropylbenzene	0.0012	0.2	MG/KG	OC-SB-711-4.0/6.0-XXX	4 / 47	0.0037 - 1.9	0.2	NA	990 ns			No	BSL
91-20-3	Naphthalene	0.0009	0.18	MG/KG	OC-SB-701-4.0/6.0-XXX	6 / 47	0.018 - 9.3	0.18	NA	8.6 c**			No	BSL
103-65-1	Propylbenzene	0.00049	0.007	MG/KG	OC-SB-701-4.0/6.0-XXX	3 / 47	0.0037 - 1.9	0.007	NA	2400 ns			No	BSL
108-88-3	Toluene	0.00029	0.0042	MG/KG	OC-SB-704-2.0/4.0-XXX	8 / 47	0.0037 - 1.9	0.0042	NA	4700 ns			No	BSL
1330-20-7	Xylenes, Total	0.00075	0.0026	MG/KG	OC-SB-701-4.0/6.0-XXX	6 / 47	0.0037 - 1.9	0.0026	NA	250 n			No	BSL
	Semivolatile Organics													
120-82-1	1,2,4-Trichlorobenzene	0.0017	0.023	MG/KG	OC-SB-709-2.0/4.0-XXX	7 / 47	0.034 - 1.1	0.023	NA	26 n			No	BSL
90-12-0	1-Methylnaphthalene	0.002	0.06	MG/KG	OC-SB-705-4.0/6.0-XXX	4 / 47	0.0069 - 0.072	0.06	NA	73 c*			No	BSL
105-67-9	2,4-Dimethylphenol	0.0039	0.012	MG/KG	OC-SB-711-2.0/4.0-XXX	2 / 47	0.034 - 1.1	0.012	NA	1600 n			No	BSL
91-57-6	2-Methylnaphthalene	0.0019	0.1	MG/KG	OC-SB-705-4.0/6.0-XXX	5 / 47	0.0069 - 0.19	0.1	NA	300 n			No	BSL
101-55-3	4-Bromophenyl phenyl ether	0.19	0.19	MG/KG	OC-SB-706-2.0/4.0-XXX	1 / 47	0.034 - 1.1	0.19	NA				Yes	NSL
7005-72-3	4-Chlorophenyl phenyl ether	0.0064	0.0064	MG/KG	OC-SB-704-2.0/4.0-XXX	1 / 47	0.034 - 1.1	0.0064	NA				Yes	NSL
83-32-9	Acenaphthene	0.0055	0.017	MG/KG	OC-SB-712-6.0/8.0-XXX	2 / 47	0.0069 - 0.21	0.017	NA	4500 n			No	BSL
208-96-8	Acenaphthylene	0.0017	0.0063	MG/KG	OC-SB-712-6.0/8.0-XXX	4 / 47	0.0069 - 0.21	0.0063	NA	2300 n			No	BSL
98-86-2	Acetophenone	0.0044	0.0083	MG/KG	OC-SB-709-4.0/6.0-XXX	3 / 47	0.069 - 2.1	0.0083	NA	12000 ns			No	BSL
62-53-3	Aniline	0.017	0.017	MG/KG	OC-SB-708-6.0/8.0-XXX	1 / 47	0.034 - 1.1	0.017	NA	400 c**			No	BSL
120-12-7	Anthracene	0.0021	0.06	MG/KG	OC-SB-711-4.0/6.0-XXX	9 / 47	0.0069 - 0.21	0.06	NA	23000 n			No	BSL
100-52-7	Benzaldehyde	0.0067	0.23	MG/KG	OC-SB-705-2.0/4.0-XXX	3 / 47	0.069 - 2.1	0.23	NA	820 c*			No	BSL
56-55-3	Benzo(a)anthracene	0.0014	0.072	MG/KG	OC-SB-712-6.0/8.0-XXX	19 / 47	0.0069 - 0.21	0.072	NA	21 c			No	BSL
50-32-8	Benzo(a)pyrene	0.0034	0.067	MG/KG	OC-SB-712-6.0/8.0-XXX	11 / 47	0.0069 - 0.21	0.067	NA	2.1 c*			No	BSL
205-99-2	Benzo(b)fluoranthene	0.0021	0.068	MG/KG	OC-SB-712-6.0/8.0-XXX	16 / 47	0.0069 - 0.21	0.068	NA	21 c			No	BSL
191-24-2	Benzo(ghi)perylene	0.0018	0.056	MG/KG	OC-SB-712-6.0/8.0-XXX	13 / 47	0.0069 - 0.21	0.056	NA	2300 n			No	BSL
207-08-9	Benzo(k)fluoranthene	0.003	0.032	MG/KG	OC-SB-712-6.0/8.0-XXX	9 / 47	0.0069 - 0.21	0.032	NA	210 c			No	BSL
100-51-6	Benzyl alcohol	0.059	0.059	MG/KG	OC-SB-711-6.0/8.0-XXX	1 / 47	0.034 - 1.1	0.059	NA	8200 n			No	BSL
92-52-4	Biphenyl	0.0017	14	MG/KG	OC-SB-711-4.0/6.0-XXX	13 / 47	0.034 - 1.1	14	NA	20 n			No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.043	420	MG/KG	OC-SB-711-4.0/6.0-XXX	33 / 47	0.34 - 0.41	420	NA	160 c*			Yes	ASL
86-74-8	Carbazole	0.0017	0.055	MG/KG	OC-SB-706-2.0/4.0-XXX	8 / 47	0.0069 - 0.21	0.055	NA				Yes	NSL
218-01-9	Chrysene	0.0021	0.075	MG/KG	OC-SB-712-6.0/8.0-XXX	18 / 47	0.0069 - 0.21	0.075	NA	2100 c			No	BSL
53-70-3	Dibenz(a,h)anthracene	0.0027	0.012	MG/KG	OC-SB-712-6.0/8.0-XXX	4 / 47	0.0069 - 0.21	0.012	NA	2.1 c			No	BSL
132-64-9	Dibenzofuran	0.0094	0.029	MG/KG	OC-SB-706-2.0/4.0-XXX	2 / 47	0.034 - 1.1	0.029	NA	120 n			No	BSL
84-66-2	Diethylphthalate	0.02	0.025	MG/KG	OC-SB-708-4.0/6.0-XXX	2 / 47	0.034 - 1.1	0.025	NA	66000 n			No	BSL
131-11-3	Dimethylphthalate	0.002	0.002	MG/KG	OC-SB-702-4.0/6.0-XXX	1 / 47	0.034 - 1.1	0.002	NA	66000 n			No	BSL
84-74-2	Di-n-butylphthalate	0.029	2.1	MG/KG	OC-SB-706-2.0/4.0-XXX	3 / 47	0.034 - 1.1	2.1	NA	8200 n			No	BSL
117-84-0	Di-n-octylphthalate	0.023	0.023	MG/KG	OC-SB-707-4.0/6.0-XXX	1 / 47	0.034 - 1.1	0.023	NA	820 n			No	BSL
206-44-0	Fluoranthene	0.0028	0.16	MG/KG	OC-SB-711-4.0/6.0-XXX	22 / 47	0.0069 - 0.21	0.16	NA	3000 n			No	BSL
86-73-7	Fluorene	0.0019	0.012	MG/KG	OC-SB-712-6.0/8.0-XXX	4 / 47	0.0069 - 0.21	0.012	NA	3000 n			No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.002	0.038	MG/KG	OC-SB-712-6.0/8.0-XXX	12 / 47	0.0069 - 0.21	0.038	NA	21 c			No	BSL
91-20-3	Naphthalene	0.0014	0.54	MG/KG	OC-SB-701-4.0/6.0-XXX	16 / 47	0.0069 - 0.21	0.54	NA	8.6 c**			No	BSL
86-30-6	N-Nitrosodiphenylamine	0.012	54	MG/KG	OC-SB-711-4.0/6.0-XXX	21 / 47	0.034 - 0.075	54	NA	470 c			No	BSL
85-01-8	Phenanthrene	0.0022	0.66	MG/KG	OC-SB-711-4.0/6.0-XXX	32 / 47	0.007 - 0.21	0.66	NA	2300 n			No	BSL
108-95-2	Phenol	0.011	8.8	MG/KG	OC-SB-711-2.0/4.0-XXX	10 / 47	0.034 - 1.1	8.8	NA	25000 n			No	BSL
129-00-0	Pyrene	0.0017	0.15	MG/KG	OC-SB-712-6.0/8.0-XXX	23 / 47	0.0069 - 0.21	0.15	NA	2300 n			No	BSL

Table 2
Selection of Chemicals of Potential Concern - Containment Area Soil (2-10 ft)
Human Health Risk Assessment
Olin Chemical Superfund Site
Wilmington, Massachusetts

CAS Number	Chemical	Minimum (1) Concentration	Maximum (1) Concentration	Units	Location of Maximum Concentration	Frequency of Detection	Range of Reporting Limits for Non Detects	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (4)	Potential ARAR/TBC Value (5)	Potential ARAR/TBC Source	Retain as COPC? (6)	Rationale for Contaminant Deletion or Selection
	Inorganics													
7429-90-5	Aluminum	2100	15000	MG/KG	OC-SB-704-6.0/8.0-XXX	47 / 47	- - -	15000	16279	110000 nm			No	BSL
7440-36-0	Antimony	0.45	1.2	MG/KG	OC-SB-707-2.0/4.0-XXX	12 / 47	15 - 83	1.2	ND	47 n			No	BSL
7440-38-2	Arsenic	0.76	29	MG/KG	OC-SB-707-2.0/4.0-XXX	47 / 47	- - -	29	11.7	3 c*R			Yes	ASL
7440-39-3	Barium	6.6	79	MG/KG	OC-SB-704-6.0/8.0-XXX	47 / 47	- - -	79	17.7	22000 n			No	BSL
7440-41-7	Beryllium	0.08	0.67	MG/KG	OC-SB-704-6.0/8.0-XXX	47 / 47	- - -	0.67	0.40	230 n			No	BSL
7440-43-9	Cadmium	0.036	9.3	MG/KG	OC-SB-711-4.0/6.0-XXX	23 / 47	0.21 - 0.26	9.3	0.32	98 n			No	BSL
7440-70-2	Calcium	550	44000	MG/KG	OC-SB-701-2.0/4.0-XXX	47 / 47	- - -	44000	680				No	E
7440-47-3	Chromium	5.3	1300	MG/KG	OC-SB-706-6.0/8.0-XXX	47 / 47	- - -	1300	12.8	180000 nm			No	BSL
18540-29-9	Chromium, Hexavalent	0.18	20.8	MG/KG	OC-SB-706-6.0/8.0-XXX	44 / 47	0.44 - 0.49	20.8	NA	6.3 c*			Yes	ASL
7440-48-4	Cobalt	0.79	13	MG/KG	OC-SB-707-2.0/4.0-XXX	47 / 47	- - -	13	3.4	35 n			No	BSL
7440-50-8	Copper	0.75	27	MG/KG	OC-SB-706-2.0/4.0-XXX	47 / 47	- - -	27	6.7	4700 n			No	BSL
7439-89-6	Iron	2700	23000	MG/KG	OC-SB-706-6.0/8.0-XXX	47 / 47	- - -	23000	15564	82000 n			No	BSL
7439-92-1	Lead	1.7	22	MG/KG	OC-SB-702-2.0/4.0-XXX	47 / 47	- - -	22	28	800 G			No	BSL
7439-95-4	Magnesium	820	7300	MG/KG	OC-SB-708-4.0/6.0-XXX	47 / 47	- - -	7300	1215				No	E
7439-96-5	Manganese	31	310	MG/KG	OC-SB-707-2.0/4.0-XXX	47 / 47	- - -	310	75	2600 n			No	BSL
7439-97-6	Mercury	0.0086	0.19	MG/KG	OC-SB-711-2.0/4.0-XXX	19 / 47	0.019 - 0.025	0.19	0.12	4.6 ns			No	BSL
7440-02-0	Nickel	2.5	40	MG/KG	OC-SB-707-2.0/4.0-XXX	47 / 47	- - -	40	8.4	3.6 c			Yes	ASL
7440-02-0	Potassium	2.5	40	MG/KG	OC-SB-707-2.0/4.0-XXX	47 / 47	- - -	40	682				No	E
7782-49-2	Selenium	0.5	0.79	MG/KG	OC-SB-705-6.0/8.0-XXX	7 / 47	4.1 - 5.5	0.79	0.70	580 n			No	BSL
7440-23-5	Sodium	60	470	MG/KG	OC-SB-708-8.0/10-XXX	40 / 47	150 - 180	470	50				No	E
7440-31-5	Tin	0.5	1.6	MG/KG	OC-SB-712-6.0/8.0-XXX	26 / 47	2.1 - 2.7	1.6	4.4	70000 n			No	BSL
7440-62-2	Vanadium	5.2	40	MG/KG	OC-SB-706-2.0/4.0-XXX	47 / 47	- - -	40	25	580 n			No	BSL
7440-66-6	Zinc	6.4	78	MG/KG	OC-SB-711-2.0/4.0-XXX	47 / 47	- - -	78	19.6	35000 n			No	BSL
7664-41-7	Ammonia	3.5	58	MG/KG	OC-SB-711-6.0/8.0-XXX	45 / 47	6.6 - 9.9	58					Yes	NSL
16887-00-6	Chloride	4.1	19	MG/KG	OC-SB-710-2.0/4.0-XXX	14 / 47	10 - 13	19	NA				Yes	NSL
14808-79-8	Sulfate	12	16000	MG/KG	OC-SB-704-2.0/4.0-XXX	47 / 47	- - -	16000	NA				Yes	NSL
	Specialty Compounds													
50-00-0	Formaldehyde	1.3	11	MG/KG	OC-SB-710-6.0/8.0-XXX	26 / 63	2.1 - 2.6	11	NA	50 c**			No	BSL
302-01-2	Hydrazine	0.0013	0.019	MG/KG	OC-SB-704-2.0/4.0-XXX	31 / 63	0.0053 - 0.0069	0.019	NA	0.14 c**			No	BSL

Prepared by / Date: CF 5/27/2020
Checked by / Date: MJM 06/01/2020

(1) Minimum or maximum concentration detected in data set. Samples included in data set are identified in Attachment A.
(2) The concentration used for screening is the maximum detected concentration.
(3) Background value is the site specific background upper prediction limit concentration.
(4) Values are the Regional Screening Levels (RSLs) obtained from USEPA May 2020.
Values used for screening are the industrial soil RSLs (the lesser of the concentrations associated with cancer risk equal to 1E-06 and non-cancer hazard quotient of 0.1).
RSL for 2,4,4-Trimethylpentene used for 2,4,4-Trimethyl-1-pentene and 2,4,4-Trimethyl-2-pentene
RSL for Chromium (III), Insoluble Salts used for Chromium
RSL for pyrene used for phenanthrene, acenaphthylene, benzo(ghi)perylene.
RSL for di-ethyl phthalate used for Dimethylphthalate
RSL for 1,4-dichlorobenzene used for 1,3-Dichorobenzene
RSL for Manganese (non-diet) used for Manganese.
n - RSL is based on a non-cancer hazard quotient of 0.1.
c - RSL is based on an excess lifetime cancer risk of 1 in 1 million.
c* - where n RSL < 100X c RSL.
n[a] - Value is based on a non-cancer endpoint because RSL at a hazard index of 0.1 is lower than RSL at cancer risk equal to 1E-06.
ns - RSL is based on a non-cancer hazard quotient of 0.1; concentration may exceed Csat.
nm - RSL is based on a non-cancer hazard quotient of 0.1; concentration may exceed ceiling limit.
G - see user guide on lead.
(5) There are no Applicable or Relevant and Appropriate Requirements / To Be Considered (ARAR/TBC) for soil.
(6) Analyte is selected as a COPC if the concentration used for screening exceeds the RSL or if no screening value is available.
ASL - Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
BSL - Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
NSL - No screening level available; the anlayte was selected as a COPC.
E - Compound is an essential nutrient.
mg/Kg - milligrams per kilogram.
COPC - Chemical of potential concern.
ND - Not detected
NC - Not calculated, too few detections
NA - Not analyzed

Table 3
Selection of Chemicals of Potential Concern - Contanment Area Soil (0-10 ft)
Human Health Risk Assessment
Olin Chemical Superfund Site
Wilmington, Massachusetts

CAS Number	Chemical	Minimum (1) Concentration	Maximum (1) Concentration	Units	Location of Maximum Concentration	Frequency of Detection	Range of Reporting Limits for Non Detects	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (4)	Potential ARAR/TBC Value (5)	Potential ARAR/TBC Source	Retain as COPC? (6)	Rationale for Contaminant Deletion or Selection
	Volatile Organics													
75-34-3	1,1-Dichloroethane	0.0007	0.00083	MG/KG	OC-SB-707-2.0/4.0-XXX	2 / 68	0.0023 - 1.9	0.00083	NA	16 c			No	BSL
120-82-1	1,2,4-Trichlorobenzene	0.00036	0.0025	MG/KG	OC-SB-707-0.0/2.0-XXX	10 / 68	0.0023 - 1.9	0.0025	NA	26 n			No	BSL
95-63-6	1,2,4-Trimethylbenzene	0.0027	0.016	MG/KG	OC-SB-701-4.0/6.0-XXX	4 / 68	0.0023 - 1.9	0.016	NA	180 n			No	BSL
108-67-8	1,3,5-Trimethylbenzene	0.00037	0.0014	MG/KG	OC-SB-704-0.0/2.0-XXX	6 / 68	0.0023 - 1.9	0.0014	NA	150 n			No	BSL
541-73-1	1,3-Dichlorobenzene	0.00032	0.00035	MG/KG	OC-SB-710-4.0/6.0-XXX	2 / 68	0.0023 - 1.9	0.00035	NA	11 c			No	BSL
107-39-1	2,4,4-Trimethyl-1-pentene	0.00076	8	MG/KG	OC-SB-711-4.0/6.0-XXX	36 / 68	0.0037 - 1.2	8	NA	1200 ns			No	BSL
107-40-4	2,4,4-Trimethyl-2-pentene	0.00056	6.3	MG/KG	OC-SB-711-4.0/6.0-XXX	27 / 68	0.0037 - 1.2	6.3	NA	1200 ns			No	BSL
78-93-3	2-Butanone	0.0044	0.56	MG/KG	OC-SB-705-6.0/8.0-XXX	26 / 68	0.018 - 9.3	0.56	NA	19000 n			No	BSL
99-87-6	4-iso-Propyltoluene	0.00041	0.42	MG/KG	OC-SB-711-4.0/6.0-XXX	8 / 68	0.0023 - 1.9	0.42	NA				Yes	NSL
79-20-9	Acetic acid, methyl ester	0.0063	0.33	MG/KG	OC-SB-711-4.0/6.0-XXX	4 / 68	0.037 - 19	0.33	NA	120000 nms			No	BSL
67-64-1	Acetone	0.0042	0.099	MG/KG	OC-SB-701-4.0/6.0-XXX	38 / 68	0.19 - 93	0.099	NA	67000 n			No	BSL
71-43-2	Benzene	0.0002	0.00082	MG/KG	OC-SB-701-4.0/6.0-XXX	5 / 68	0.0023 - 1.9	0.00082	NA	5.1 c**			No	BSL
75-15-0	Carbon disulfide	0.0024	0.0066	MG/KG	OC-SB-701-4.0/6.0-XXX	10 / 68	0.0023 - 1.9	0.0066	NA	350 n			No	BSL
60-29-7	Diethyl ether	0.0028	0.0034	MG/KG	OC-SB-704-0.0/2.0-XXX	2 / 68	0.0023 - 1.9	0.0034	NA	23000 ns			No	BSL
100-41-4	Ethylbenzene	0.00027	0.37	MG/KG	OC-SB-711-4.0/6.0-XXX	7 / 68	0.0023 - 1.9	0.37	NA	25 c*			No	BSL
98-82-8	Isopropylbenzene	0.0012	0.2	MG/KG	OC-SB-711-4.0/6.0-XXX	4 / 68	0.0023 - 1.9	0.2	NA	990 ns			No	BSL
91-20-3	Naphthalene	0.0009	0.18	MG/KG	OC-SB-701-4.0/6.0-XXX	8 / 68	0.018 - 9.3	0.18	NA	8.6 c**			No	BSL
103-65-1	Propylbenzene	0.00049	0.007	MG/KG	OC-SB-701-4.0/6.0-XXX	3 / 68	0.0023 - 1.9	0.007	NA	2400 ns			No	BSL
108-88-3	Toluene	0.00029	0.0042	MG/KG	OC-SB-704-2.0/4.0-XXX	10 / 68	0.0023 - 1.9	0.0042	NA	4700 ns			No	BSL
1330-20-7	Xylenes, Total	0.00075	0.0026	MG/KG	OC-SB-701-4.0/6.0-XXX	7 / 68	0.0037 - 1.9	0.0026	NA	250 n			No	BSL
	Semivolatile Organics													
120-82-1	1,2,4-Trichlorobenzene	0.0017	0.068	MG/KG	OC-SB-707-0.0/2.0-XXX	12 / 68	0.034 - 1.1	0.068	NA	26 n			No	BSL
90-12-0	1-Methylnaphthalene	0.002	0.06	MG/KG	OC-SB-705-4.0/6.0-XXX	6 / 68	0.0069 - 0.072	0.06	NA	73 c*			No	BSL
105-67-9	2,4-Dimethylphenol	0.0039	0.012	MG/KG	OC-SB-711-2.0/4.0-XXX	2 / 68	0.034 - 1.1	0.012	NA	1600 n			No	BSL
91-57-6	2-Methylnaphthalene	0.0019	0.1	MG/KG	OC-SB-705-4.0/6.0-XXX	7 / 68	0.0069 - 0.19	0.1	NA	300 n			No	BSL
101-55-3	4-Bromophenyl phenyl ether	0.19	0.19	MG/KG	OC-SB-706-2.0/4.0-XXX	1 / 68	0.034 - 1.1	0.19	NA				Yes	NSL
7005-72-3	4-Chlorophenyl phenyl ether	0.0064	0.031	MG/KG	OC-SB-704-0.0/2.0-XXX	2 / 68	0.034 - 1.1	0.031	NA				Yes	NSL
83-32-9	Acenaphthene	0.0055	0.017	MG/KG	OC-SB-712-6.0/8.0-XXX	3 / 68	0.0069 - 0.21	0.017	NA	4500 n			No	BSL
208-96-8	Acenaphthylene	0.0016	0.0063	MG/KG	OC-SB-712-6.0/8.0-XXX	7 / 68	0.0069 - 0.21	0.0063	NA	2300 n			No	BSL
98-86-2	Acetophenone	0.0034	0.0083	MG/KG	OC-SB-709-4.0/6.0-XXX	6 / 68	0.036 - 2.1	0.0083	NA	12000 ns			No	BSL
62-53-3	Aniline	0.017	0.017	MG/KG	OC-SB-708-6.0/8.0-XXX	1 / 68	0.034 - 1.1	0.017	NA	400 c**			No	BSL
120-12-7	Anthracene	0.0021	0.06	MG/KG	OC-SB-711-4.0/6.0-XXX	13 / 68	0.0069 - 0.21	0.06	NA	23000 n			No	BSL
100-52-7	Benzaldehyde	0.0067	0.23	MG/KG	OC-SB-705-2.0/4.0-XXX	7 / 68	0.036 - 2.1	0.23	NA	820 c*			No	BSL
56-55-3	Benzo(a)anthracene	0.0014	0.072	MG/KG	OC-SB-712-6.0/8.0-XXX	31 / 68	0.0069 - 0.21	0.072	NA	21 c			No	BSL
50-32-8	Benzo(a)pyrene	0.0026	0.067	MG/KG	OC-SB-712-6.0/8.0-XXX	23 / 68	0.0069 - 0.21	0.067	NA	2.1 c*			No	BSL
205-99-2	Benzo(b)fluoranthene	0.0021	0.068	MG/KG	OC-SB-712-6.0/8.0-XXX	29 / 68	0.0069 - 0.21	0.068	NA	21 c			No	BSL
191-24-2	Benzo(ghi)perylene	0.0018	0.056	MG/KG	OC-SB-712-6.0/8.0-XXX	22 / 68	0.0069 - 0.21	0.056	NA	2300 n			No	BSL
207-08-9	Benzo(k)fluoranthene	0.003	0.032	MG/KG	OC-SB-712-6.0/8.0-XXX	15 / 68	0.0069 - 0.21	0.032	NA	210 c			No	BSL
100-51-6	Benzyl alcohol	0.059	0.059	MG/KG	OC-SB-711-6.0/8.0-XXX	1 / 68	0.034 - 1.1	0.059	NA	8200 n			No	BSL
92-52-4	Biphenyl	0.0017	14	MG/KG	OC-SB-711-4.0/6.0-XXX	21 / 68	0.034 - 1.1	14	NA	20 n			No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.043	420	MG/KG	OC-SB-711-4.0/6.0-XXX	54 / 68	0.34 - 0.41	420	NA	160 c*			Yes	ASL
86-74-8	Carbazole	0.0017	0.055	MG/KG	OC-SB-706-2.0/4.0-XXX	10 / 68	0.0069 - 0.21	0.055	NA				Yes	NSL
218-01-9	Chrysene	0.0021	0.075	MG/KG	OC-SB-712-6.0/8.0-XXX	31 / 68	0.0069 - 0.21	0.075	NA	2100 c			No	BSL
53-70-3	Dibenz(a,h)anthracene	0.0021	0.012	MG/KG	OC-SB-712-6.0/8.0-XXX	9 / 68	0.0069 - 0.21	0.012	NA	2.1 c			No	BSL
132-64-9	Dibenzofuran	0.0088	0.029	MG/KG	OC-SB-706-2.0/4.0-XXX	3 / 68	0.034 - 1.1	0.029	NA	120 n			No	BSL
84-66-2	Diethylphthalate	0.02	0.025	MG/KG	OC-SB-708-4.0/6.0-XXX	2 / 68	0.034 - 1.1	0.025	NA	66000 n			No	BSL
131-11-3	Dimethylphthalate	0.002	0.002	MG/KG	OC-SB-702-4.0/6.0-XXX	1 / 68	0.034 - 1.1	0.002	NA	66000 n			No	BSL
84-74-2	Di-n-butylphthalate	0.018	2.1	MG/KG	OC-SB-706-2.0/4.0-XXX	5 / 68	0.034 - 1.1	2.1	NA	8200 n			No	BSL
117-84-0	Di-n-octylphthalate	0.023	0.061	MG/KG	OC-SB-709-0.0/2.0-XXX	2 / 68	0.034 - 1.1	0.061	NA	820 n			No	BSL

Table 3
Selection of Chemicals of Potential Concern - Contanment Area Soil (0-10 ft)
Human Health Risk Assessment
Olin Chemical Superfund Site
Wilmington, Massachusetts

CAS Number	Chemical	Minimum (1) Concentration	Maximum (1) Concentration	Units	Location of Maximum Concentration	Frequency of Detection	Range of Reporting Limits for Non Detects	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (4)	Potential ARAR/TBC Value (5)	Potential ARAR/TBC Source	Retain as COPC? (6)	Rationale for Contaminant Deletion or Selection
	Semivolatile Organics													
101-84-8	Diphenyl ether	0.015	0.015	MG/KG	OC-SS-421-0.0/1.0-XXX	2 / 10	0.036 - 0.044	0.015	NA	14 n			No	BSL
122-39-4	Diphenylamine	0.014	0.02	MG/KG	OC-SS-431-0.0/1.0-XXX	2 / 5	0.038 - 0.039	0.02	NA	8200 n			No	BSL
206-44-0	Fluoranthene	0.0028	0.16	MG/KG	OC-SB-711-4.0/6.0-XXX	40 / 68	0.0069 - 0.21	0.16	NA	3000 n			No	BSL
86-73-7	Fluorene	0.0019	0.022	MG/KG	OC-SS-431-0.0/1.0-XXX	7 / 68	0.0069 - 0.21	0.022	NA	3000 n			No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.0017	0.038	MG/KG	OC-SB-712-6.0/8.0-XXX	21 / 68	0.0069 - 0.21	0.038	NA	21 c			No	BSL
91-20-3	Naphthalene	0.0014	0.54	MG/KG	OC-SB-701-4.0/6.0-XXX	24 / 68	0.0069 - 0.21	0.54	NA	8.6 c**			No	BSL
86-30-6	N-Nitrosodiphenylamine	0.012	54	MG/KG	OC-SB-711-4.0/6.0-XXX	38 / 69	0.034 - 0.2	54	NA	470 c			No	BSL
85-01-8	Phenanthrene	0.0022	0.66	MG/KG	OC-SB-711-4.0/6.0-XXX	43 / 68	0.007 - 0.21	0.66	NA	2300 n			No	BSL
108-95-2	Phenol	0.011	8.8	MG/KG	OC-SB-711-2.0/4.0-XXX	13 / 68	0.034 - 1.1	8.8	NA	25000 n			No	BSL
129-00-0	Pyrene	0.0017	0.15	MG/KG	OC-SB-712-6.0/8.0-XXX	38 / 68	0.0069 - 0.21	0.15	NA	2300 n			No	BSL
	Inorganics													
7429-90-5	Aluminum	2100	15000	MG/KG	OC-SB-704-6.0/8.0-XXX	68 / 68	- - -	15000	16279	110000 nm			No	BSL
7440-36-0	Antimony	0.45	1.2	MG/KG	OC-SB-707-2.0/4.0-XXX	17 / 68	0.57 - 83	1.2	ND	47 n			No	BSL
7440-38-2	Arsenic	0.76	33	MG/KG	OC-SB-707-0.0/2.0-XXX	68 / 68	- - -	33	11.7	3 c*R			Yes	ASL
7440-39-3	Barium	6.6	89	MG/KG	OC-SB-703-0.0/2.0-XXX	68 / 68	- - -	89	17.7	22000 n			No	BSL
7440-41-7	Beryllium	0.08	0.67	MG/KG	OC-SB-704-6.0/8.0-XXX	68 / 68	- - -	0.67	0.40	230 n			No	BSL
7440-43-9	Cadmium	0.035	9.3	MG/KG	OC-SB-711-4.0/6.0-XXX	44 / 68	0.21 - 0.26	9.3	0.32	98 n			No	BSL
7440-70-2	Calcium	550	110000	MG/KG	OC-SB-704-0.0/2.0-XXX	68 / 68	- - -	110000	680				No	E
7440-47-3	Chromium	5.3	1300	MG/KG	OC-SB-706-6.0/8.0-XXX	68 / 68	- - -	1300	12.8	180000 nm			No	BSL
18540-29-9	Chromium, Hexavalent	0.18	20.8	MG/KG	OC-SB-706-6.0/8.0-XXX	54 / 58	0.44 - 0.49	20.8	NA	6.3 c*			Yes	ASL
7440-48-4	Cobalt	0.79	13	MG/KG	OC-SB-707-2.0/4.0-XXX	68 / 68	- - -	13	3.4	35 n			No	BSL
7440-50-8	Copper	0.75	27	MG/KG	OC-SB-706-2_0/4_0-XXX	68 / 68	- - -	27	6.7	4700 n			No	BSL
7439-89-6	Iron	2700	23000	MG/KG	OC-SB-706-6.0/8.0-XXX	68 / 68	- - -	23000	15564	82000 n			No	BSL
7439-92-1	Lead	1.7	22	MG/KG	OC-SB-702-2.0/4.0-XXX	68 / 68	- - -	22	28	800 G			No	BSL
7439-95-4	Magnesium	820	7300	MG/KG	OC-SB-708-4.0/6.0-XXX	68 / 68	- - -	7300	1215				No	E
7439-96-5	Manganese	31	370	MG/KG	OC-SS-430-0.0/1.0-XXX	68 / 68	- - -	370	75	2600 n			No	BSL
7439-97-6	Mercury	0.0086	0.19	MG/KG	OC-SB-711-2.0/4.0-XXX	30 / 68	0.019 - 0.21	0.19	0.12	4.6 ns			No	BSL
7440-02-0	Nickel	2.5	40	MG/KG	OC-SB-707-2.0/4.0-XXX	68 / 68	- - -	40	8.4	3.6 c			Yes	ASL
9/7/7440	Potassium	340	4300	MG/KG	OC-SB-704-6.0/8.0-XXX	68 / 68	- - -	4300	682				No	E
7782-49-2	Selenium	0.5	1.1	MG/KG	OC-SB-711-0.0/2.0-XXX	10 / 68	0.57 - 5.5	1.1	0.70	580 n			No	BSL
7440-22-4	Silver	0.13	1.2	MG/KG	OC-SS-429-0.0/1.0-XXX	10 / 68	0.61 - 0.82	1.2	ND	580 n			No	BSL
7440-23-5	Sodium	46	470	MG/KG	OC-SB-708-8.0/10-XXX	60 / 68	150 - 180	470	50				No	E
7440-31-5	Tin	0.5	36	MG/KG	OC-SS-429-0.0/1.0-XXX	46 / 68	2.1 - 2.7	36	4.4	70000 n			No	BSL
7440-62-2	Vanadium	5.2	40	MG/KG	OC-SB-706-2.0/4.0-XXX	68 / 68	- - -	40	25	580 n			No	BSL
7440-66-6	Zinc	6.4	78	MG/KG	OC-SB-711-2.0/4.0-XXX	68 / 68	- - -	78	19.6	35000 n			No	BSL
7664-41-7	Ammonia, Nitrogren	3.5	58	MG/KG	OC-SB-711-6.0/8.0-XXX	59 / 68	6.6 - 9.9	58	NA				Yes	NSL
16887-00-6	Chloride	4.1	19	MG/KG	OC-SS-422-0.0/1.0-XXX	18 / 58	10 - 13	19	NA				Yes	NSL
14808-79-8	Sulfate	12	18000	MG/KG	OC-SB-703-0.0/2.0-XXX	58 / 58	- - -	18000	NA				Yes	NSL
	Specialty Compounds													
50-00-0	Formaldehyde	0.096	11	MG/KG	OC-SB-710-6.0/8.0-XXX	26 / 63	0.11 - 2.6	11	NA	50 c**			No	BSL
302-01-2	Hydrazine	0.00062	0.086	MG/KG	OC-SB-704-0.0/2.0-XXX	31 / 63	0.0023 - 0.0069	0.086	NA	0.14 c**			No	BSL

(1) Minimum or maximum concentration detected in data set. Samples included in data set are identified in Attachment A.
(2) The concentration used for screening is the maximum detected concentration.
(3) Background value is the site specific background upper prediction limit concentration.
(4) Values are the Regional Screening Levels (RSLs) obtained from USEPA May 2020.

Prepared by / Date: CF 5/27/2020
Checked by / Date: MJM 06/01/2020

Table 3
Selection of Chemicals of Potential Concern - Contanment Area Soil (0-10 ft)
Human Health Risk Assessment
Olin Chemical Superfund Site
Wilmington, Massachusetts

CAS Number	Chemical	Minimum (1) Concentration	Maximum (1) Concentration	Units	Location of Maximum Concentration	Frequency of Detection	Range of Reporting Limits for Non Detects	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (4)	Potential ARAR/TBC Value (5)	Potential ARAR/TBC Source	Retain as COPC? (6)	Rationale for Contaminant Deletion or Selection

Values used for screening are the industrial soil RSLs (the lesser of the concentrations associated with cancer risk equal to 1E-06 and non-cancer hazard quotient of 0.1).
RSL for 2,4,4-Trimethylpentene used for 2,4,4-Trimethyl-1-pentene and 2,4,4-Trimethyl-2-pentene
RSL for Chromium (III), Insoluble Salts used for Chromium
RSL for pyrene used for phenanthrene, acenaphthylene, benzo(ghi)perylene.
RSL for di-ethyl phthalate used for Dimethylphthalate
RSL for 1,4 dichlorobenzene used for 1,3-Dichorobenzene
RSL for Manganese (non-diet) used for Manganese.
n - RSL is based on a non-cancer hazard quotient of 0.1.
c - RSL is based on an excess lifetime cancer risk of 1 in 1 million.
c* - where n RSL < 100X c RSL.
n[a] - Value is based on a non-cancer endpoint because RSL at a hazard index of 0.1 is lower than RSL at cancer risk equal to 1E-06.
ns - RSL is based on a non-cancer hazard quotient of 0.1; concentration may exceed Csat.
nm - RSL is based on a non-cancer hazard quotient of 0.1; concentration may exceed ceiling limit.
G - see user guide on lead.
(5) There are no Applicable or Relevant and Appropriate Requirements / To Be Considered (ARAR/TBC) for soil.
(6) Analyte is selected as a COPC if the concentration used for screening exceeds the RSL or if no screening value is available.
ASL - Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
BSL - Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
NSL - No screening level available; the anlayte was selected as a COPC.
E - Compound is an essential nutrient.
mg/Kg - milligrams per kilogram.
COPC - Chemical of potential concern.
ND - Not detected
NC - Not calculated, too few detections
NA - Not analyzed

Table 4
Exposure Point Concentrations -Soil (0-2 ft, 2-10 ft, 0-10 ft)
Human Health Risk Assessment
Olin Chemical Superfund Site
Wilmington, Massachusetts

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (2) Calculation		Maximum Detected Concentration	Exposure Point Concentration				CAS #	Frequency of Detection		
							EPC	Units	Statistic	Rationale				
Containment Area	**0-2FT**													
	Semivolatile Organics													
	4-Chlorophenyl phenyl ether	mg/Kg	0.031		NC	0.031	0.031	mg/Kg	Maximum	(3)	7005-72-3	1	/	21
	Carbazole	mg/Kg	0.0027	0.00408	95% KM (t) UCL	0.0035	0.0035	mg/Kg	Maximum	(3)	86-74-8	2	/	21
	Metals													
	Arsenic	mg/Kg	11.3	14.07	95% H-UCL	33	14	mg/Kg	UCL	(4)	7440-38-2	21	/	21
	Nickel	mg/Kg	8.9	10.55	95% Modified-t UCL	18	11	mg/Kg	UCL	(4)	7440-02-0	21	/	21
	Inorganics													
	Ammonia	mg/Kg	12.43	13.34	95% KM (t) UCL	39	13	mg/Kg	UCL	(4)	7664-41-7	14	/	21
	Chloride	mg/Kg	13.72	12.86	Gamma Adjusted KM-UCL	44	13	mg/Kg	UCL	(4)	16887-00-6	5	/	21
	Sulfate	mg/Kg	4380	8046	95% Adjusted Gamma UCL	18000	8046	mg/Kg	UCL	(4)	14808-79-8	21	/	21
	2-10FT													
	Semivolatile Organics													
	4-Bromophenyl phenyl ether	mg/Kg	0.19		NC	0.19	0.19	mg/Kg	Maximum	(3)	101-55-3	1	/	47
	4-Chlorophenyl phenyl ether	mg/Kg	0.0064		NC	0.0064	0.0064	mg/Kg	Maximum	(3)	7005-72-3	1	/	47
	4-iso-Propyltoluene	mg/Kg	0.0705	0.073	97.5% KM (Chebyshev) UCL	0.42	0.07	mg/Kg	UCL	(4)	99-87-6	6	/	47
	Bis(2-Ethylhexyl)phthalate	mg/Kg	25.93	91.93	97.5% KM (Chebyshev) UCL	420	92	mg/Kg	UCL	(4)	117-81-7	33	/	47
	Carbazole	mg/Kg	0.010	0.00717	Gamma Adjusted KM-UCL	0.055	0.0072	mg/Kg	UCL	(4)	86-74-8	8	/	47
	Metals													
	Arsenic	mg/Kg	7.206	8.681	95% Adjusted Gamma UCL	29	8.7	mg/Kg	UCL	(4)	7440-38-2	47	/	47
	Chromium, Hexavalent	mg/Kg	2.578	3.3	KM H-UCL	20.8	3.3	mg/Kg	UCL	(4)	18540-29-9	44	/	47
	Manganese	mg/Kg	117.4	133.3	95% Student's-t UCL	310	133	mg/Kg	UCL	(4)	7439-96-5	47	/	47
	Nickel	mg/Kg	12.47	14.6	95% Adjusted Gamma UCL	40	15	mg/Kg	UCL	(4)	7440-02-0	47	/	47
	Inorganics													
	Ammonia	mg/Kg	17.77	21.28	KM H-UCL	58	21	mg/Kg	UCL	(4)	7664-41-7	45	/	47
	Chloride	mg/Kg	8.657	8.183	95% GROS Adjusted Gamma UCL	19	8.2	mg/Kg	UCL	(4)	16887-00-6	14	/	47
	Sulfate	mg/Kg	1877	4047	95% Chebyshev (Mean, Sd) UCL	16000	4047	mg/Kg	UCL	(4)	14808-79-8	47	/	47
	0-10FT													
	Semivolatile Organics													
	4-Bromophenyl phenyl ether	mg/Kg	0.19		NC	0.19	0.19	mg/Kg	Maximum	(3)	101-55-3	1	/	68
	4-Chlorophenyl phenyl ether	mg/Kg	0.0187	0.0723	95% KM (Chebyshev) UCL	0.031	0.031	mg/Kg	Maximum	(3)	7005-72-3	2	/	68
	4-iso-Propyltoluene	mg/Kg	0.0533	0.0366	95% KM (Chebyshev) UCL	0.42	0.037	mg/Kg	UCL	(4)	99-87-6	8	/	68
	Bis(2-Ethylhexyl)phthalate	mg/Kg	16.48	6.397	KM H-UCL	420	6.4	mg/Kg	UCL	(4)	117-81-7	54	/	68
	Carbazole	mg/Kg	0.0086	0.00378	KM H-UCL	0.055	0.0038	mg/Kg	UCL	(4)	86-74-8	10	/	68
	Metals													
	Arsenic	mg/Kg	8.469	9.765	95% Approximate Gamma UCL	33	9.8	mg/Kg	UCL	(4)	7440-38-2	68	/	68
	Chromium, Hexavalent	mg/Kg	2.761	3.669	KM H-UCL	20.8	3.7	mg/Kg	UCL	(4)	18540-29-9	54	/	58
	Nickel	mg/Kg	11.55	12.95	95% H-UCL	40	13	mg/Kg	UCL	(4)	7440-02-0	68	/	68
	Inorganics													
	Ammonia	mg/Kg	16.5	17.89	KM H-UCL	58	18	mg/Kg	UCL	(4)	7664-41-7	59	/	68
	Chloride	mg/Kg	9.989	10.84	95% KM (Chebyshev) UCL	44	11	mg/Kg	UCL	(4)	16887-00-6	19	/	68
	Sulfate	mg/Kg	2994	5524	95% Chebyshev (Mean, Sd) UCL	18000	5524	mg/Kg	UCL	(4)	14808-79-8	68	/	68

NOTES:

Prepared by / Date: CF 05/27/2020
Checked by / Date: JPK 5/28/2020

(1) Chemicals of potential concern (COPCs) are identified in Tables 1-3.
(2) 95% UCL is calculated using ProUCL software (V. 5.0); calculations presented in Attachment B
(3) The maximum detected concentration is used as the EPC because it is lower than the calculated 95% UCL, or no 95% UCL is calculated.
(4) The 95% UCL is used as the EPC because the calculated 95% UCL is less than the maximum detected concentration.
NC - Not Calculated
Only one or two distinct data values were detected

EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean
mg/Kg = milligrams per kilogram

Table 5
Summary of Potential Carcinogenic Risk and Hazard Index: Containment Area Soil

Human Health Risk Assessment
Olin Wilmington
Wilmington, MA

Medium/Exposure Pathway	ELCR	HI
Future Land Use		
Construction Worker Containment Area		
Combined Soil - Incidential Ingestion	1.0E-06	0.011
Combined Soil - Dermal Contact	6.2E-08	0.00090
Combined Soil - Dust Inhalation	7.3E-09	0.0011
Total ELCR and HI:	**1E-06**	**0.01**
Outdoor Worker Containment Area		
Surface Soil - Incidential Ingestion	7.0E-06	0.025
Surface Soil - Dermal Contact	1.3E-06	0.0082
Surface Soil - Dust Inhalation	3.4E-09	0.00016
Total ELCR and HI:	**8E-06**	**0.03**
Outdoor Worker Containment Area		
Subsurface Soil - Incidential Ingestion	7.6E-06	0.021
Subsurface Soil - Dermal Contact	1.1E-06	0.0077
Subsurface Soil - Dust Inhalation	1.7E-08	0.00012
Total ELCR and HI:	**9E-06**	**0.03**

Notes:
ELCR - Excess Lifetime Cancer Risk
HI - Hazard Index

Prepared by: CF 05/28/2020
Checked by: JPK 5/28/2020

Attachment A

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SB-701 OC-SB-701-0_0/2_0-XXX 11/11/2019 0-2	SB-702 OC-SB-702-0_0/2_0-XXX 11/8/2019 0-2	SB-703 OC-SB-703-0_0/2_0-XXX 11/5/2019 0-2	SB-704 OC-SB-704-0_0/2_0-XXX 11/7/2019 0-2	SB-705 OC-SB-705-0_0/2_0-XXX 11/8/2019 0-2	SB-706 OC-SB-706-0_0/2_0-XXX 11/6/2019 0-2	SB-707 OC-SB-707-0_0/2_0-XXX 11/7/2019 0-2	SB-708 OC-SB-708-0_0/2_0-XXX 11/4/2019 0-2	SB-709 OC-SB-709-0_0/2_0-XXX 11/6/2019 0-2
Dimethylformamide															
Dimethylformamide	MG/KG	68-12-2	0 - 16	- - -	0.16 - 0.84		0.18 U	0.16 U	0.18 U	0.26 U	0.17 U	0.2 U	0.17 U	0.2 U	0.2 U
Inorganics															
Ammonia	MG/KG	7664-41-7	10 - 11	3.8 - 15	7.3 - 7.3	6.97	4.7	4 J	7	15	3.8 J	10	6	7.3 U	4.1 J
Chloride	MG/KG	16887-00-6	5 - 21	4.7 - 44	11 - 25	9.46	12 UJ	9.3 J	5.4 J	4.7 J	11 UJ	11 UJ	5.2 J	11 UJ	12 U
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37									
Sulfate	MG/KG	14808-79-8	21 - 21	57 - 18000	- - -	4,380.19	12000 J	610 J	18000	18000 J	77 J	1000 J-	170 J	430 J	1300
Metals & Inorganics															
Aluminum	MG/KG	7429-90-5	21 - 21	5000 - 9900	- - -	7,652.38	9900	9200	9000	7700	5100	5000	8300	8600	8400
Antimony	MG/KG	7440-36-0	5 - 21	0.63 - 1	0.57 - 20	2.96	0.63 J-	17 U	20 U	19 U	17 U	0.63 J	1 J	0.72 J	19 U
Arsenic	MG/KG	7440-38-2	21 - 21	3.8 - 33	- - -	11.30	8.6	5.1	13	17	14	11	33	17	7.6
Barium	MG/KG	7440-39-3	21 - 21	12 - 89	- - -	50.95	71 J+	46	89 J	61	12	16	28	54	49 J
Beryllium	MG/KG	7440-41-7	21 - 21	0.24 - 0.5	- - -	0.33	0.46 J	0.5	0.39	0.38	0.28	0.27	0.38	0.43	0.3
Cadmium	MG/KG	7440-43-9	21 - 21	0.035 - 0.92	- - -	0.35	0.37	0.036 J	0.3 J	0.45	0.17 J	0.5	0.18 J	0.035 J	0.13 J
Calcium	MG/KG	7440-70-2	21 - 21	1200 - 110000	- - -	25,604.76	28000	14000	92000	110000	1200	1600	12000	7900	11000
Chromium	MG/KG	7440-47-3	21 - 21	13 - 180	- - -	64.90	72 J+	32	180	140	13	19	79	26	63
Chromium, Hexavalent	MG/KG	18540-29-9	10 - 11	0.95 - 5.8	0.46 - 0.46	3.26	2.8	1.6	5.8	4.1	0.46 U	0.95	2.7	4.9	2.2
Cobalt	MG/KG	7440-48-4	21 - 21	1.9 - 5.8	- - -	4.11	3.9	5.6	3.5	3.7	1.9	2.2	5.7	5.8	3.7
Copper	MG/KG	7440-50-8	21 - 21	4.5 - 11	- - -	8.40	10	8.2	9.2	8.5	4.5	5.7	11	11	7.7
Iron	MG/KG	7439-89-6	21 - 21	6400 - 20000	- - -	10,661.90	10000	13000	9200	10000	6400	7000	16000	11000	10000
Lead	MG/KG	7439-92-1	21 - 21	3.9 - 12	- - -	7.48	11	12	9.7	8.3	3.9	4.7	11	7.5	8.2
Magnesium	MG/KG	7439-95-4	21 - 21	1600 - 4000	- - -	2,738.10	3700 J+	4000	2500	2300	1600	1700	3000	3200	3100
Manganese	MG/KG	7439-96-5	21 - 21	83 - 370	- - -	152.52	180 J	270	110	93	83	87	110	170	150
Mercury	MG/KG	7439-97-6	11 - 21	0.011 - 0.048	0.022 - 0.21	0.06	0.031 J	0.041	0.037	0.035	0.022 U	0.011 J	0.042	0.016 J	0.022 J
Nickel	MG/KG	7440-02-0	21 - 21	6.1 - 18	- - -	9.50	11	8.2	8.9	8.6	6.1	6.3	15	18	10
Potassium	MG/KG	7440-09-7	21 - 21	650 - 1900	- - -	1,216.19	1200 J+	1300	980	770	650	750	890	1700	1000
Selenium	MG/KG	7782-49-2	3 - 21	0.52 - 1.1	0.57 - 5.3	1.20	4.8 U	4.6 U	5.3 U	5 U	0.52 J	0.82 J	5 U	4.2 U	5 U
Silver	MG/KG	7440-22-4	10 - 21	0.13 - 1.2	0.63 - 0.8	0.50	0.72 U	0.69 U	0.8 U	0.75 U	0.69 U	0.66 U	0.75 U	0.63 U	0.75 U
Sodium	MG/KG	7440-23-5	20 - 21	46 - 440	170 - 170	140.95	150 J	220	160 J	190	90 J	82 J	86 J	200	170 U
Thallium	MG/KG	7440-28-0	0 - 21	- - -	1.1 - 8		7.2 U	6.9 U	8 U	7.5 U	6.9 U	6.6 U	7.5 U	6.3 U	7.5 U
Tin	MG/KG	7440-31-5	20 - 21	0.52 - 36	2.5 - 2.5	11.08	0.72 J	0.91 J	1.1 J	0.97 J	0.52 J	0.59 J	0.61 J	0.65 J	2.5 U
Vanadium	MG/KG	7440-62-2	21 - 21	9.3 - 25	- - -	15.59	19 J+	25	16	18	9.3	10	19	18	16
Zinc	MG/KG	7440-66-6	21 - 21	11 - 30	- - -	20.90	26 J+	30	22	22	11	14	28	22	21
Phthalates															
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	- - -	0.11 - 0.12										
Semi-Volatile Organic Compounds															
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	5 - 21	0.0022 - 0.068	0.036 - 0.2	0.02	0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.0049 J	0.068 J	0.0022 J	0.0039 J
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
1-Methylnaphthalene	MG/KG	90-12-0	2 - 21	0.0084 - 0.023	0.0072 - 0.04	0.01	0.0082 U	0.0077 U	0.0087 U	0.023	0.0078 U	0.015 U	0.0084 J	0.0072 U	0.008 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 21	- - -	0.0072 - 0.04		0.0082 U	0.0077 U	0.0087 U	0.017 U	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 UJ	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 UJ	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 21	- - -	0.0072 - 0.04		0.0082 U	0.0077 U	0.0087 U	0.017 U	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
2,4-Dimethylphenol	MG/KG	105-67-9	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 21	- - -	0.036 - 2		0.4 U	0.38 U	0.43 U	0.84 U	0.39 U	0.72 U	1.6 U	0.36 U	0.39 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 21	- - -	0.0072 - 0.04		0.0082 U	0.0077 U	0.0087 U	0.017 U	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
2-Chlorophenol	MG/KG	95-57-8	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
2-Methylnaphthalene	MG/KG	91-57-6	2 - 21	0.01 - 0.037	0.0072 - 0.04	0.01	0.0082 U	0.0077 U	0.0087 U	0.037	0.0078 U	0.015 U	0.01 J	0.0072 U	0.008 U
2-Methylphenol	MG/KG	95-48-7	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
2-Nitroaniline	MG/KG	88-74-4	0 - 21	- - -	0.18 - 1		0.21 U	0.2 U	0.22 U	0.43 U	0.2 U	0.37 U	0.82 U	0.18 U	0.2 U
2-Nitrophenol	MG/KG	88-75-5	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	- - -	0.036 - 0.04										
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
3-Nitroaniline	MG/KG	99-09-2	0 - 21	- - -	0.18 - 1		0.21 U	0.2 U	0.22 U	0.43 U	0.2 U	0.37 U	0.82 U	0.18 U	0.2 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 21	- - -	0.18 - 1		0.21 U	0.2 U	0.22 U	0.43 UJ	0.2 U	0.37 U	0.82 U	0.18 U	0.2 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
4-Chloroaniline	MG/KG	106-47-8	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	1 - 21	0.031 - 0.031	0.036 - 0.2	0.03	0.04 U	0.038 U	0.043 U	0.031 J	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
4-Nitroaniline	MG/KG	100-01-6	0 - 21	- - -	0.18 - 1		0.21 U	0.2 U	0.22 U	0.43 U	0.2 U	0.37 U	0.82 U	0.18 U	0.2 U
4-Nitrophenol	MG/KG	100-02-7	0 - 21	- - -	0.18 - 1		0.21 U	0.2 U	0.22 U	0.43 UJ	0.2 U	0.37 U	0.82 U	0.18 U	0.2 U
Acenaphthene	MG/KG	83-32-9	1 - 21	0.016 - 0.016	0.0072 - 0.04	0.01	0.0082 U	0.0077 U	0.0087 U	0.016 J	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
Acenaphthylene	MG/KG	208-96-8	3 - 21	0.0016 - 0.003	0.0077 - 0.04	0.01	0.0082 U	0.0077 U	0.003 J	0.017 U	0.0078 U	0.015 U	0.033 U	0.0016 J	0.008 U
Acetophenone	MG/KG	98-86-2	3 - 21	0.0034 - 0.0044	0.036 - 0.4	0.04	0.082 U	0.077 U	0.087 U	0.17 U	0.078 U	0.0044 J	0.33 U	0.0034 J	0.0041 J
Aniline	MG/KG	62-53-3	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Anthracene	MG/KG	120-12-7	4 - 21	0.0026 - 0.0091	0.0077 - 0.04	0.01	0.0082 U	0.0077 U	0.0031 J	0.0091 J	0.0078 U	0.015 U	0.033 U	0.0026 J	0.008 U
Atrazine	MG/KG	1912-24-9	0 - 21	- - -	0.036 - 0.4		0.082 U	0.077 U	0.087 U	0.17 U	0.078 U	0.15 U	0.33 U	0.072 U	0.08 U
Azobenzene	MG/KG	103-33-3	0 - 21	- - -	0.036 - 0.43		0.4 U	0.38 U	0.43 U	0.41 U	0.38 U	0.36 U	0.41 U	0.36 U	0.39 U

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SB-701 OC-SB-701-0_0/2_0-XXX 11/11/2019 0-2	SB-702 OC-SB-702-0_0/2_0-XXX 11/8/2019 0-2	SB-703 OC-SB-703-0_0/2_0-XXX 11/5/2019 0-2	SB-704 OC-SB-704-0_0/2_0-XXX 11/7/2019 0-2	SB-705 OC-SB-705-0_0/2_0-XXX 11/8/2019 0-2	SB-706 OC-SB-706-0_0/2_0-XXX 11/6/2019 0-2	SB-707 OC-SB-707-0_0/2_0-XXX 11/7/2019 0-2	SB-708 OC-SB-708-0_0/2_0-XXX 11/4/2019 0-2	SB-709 OC-SB-709-0_0/2_0-XXX 11/6/2019 0-2
Benzaldehyde	MG/KG	100-52-7	4 - 21	0.01 - 0.06	0.036 - 0.4	0.05	0.082 UJ	0.077 R	0.01 J	0.17 R	0.078 R	0.15 R	0.33 R	0.072 R	0.08 R
Benzo(a)anthracene	MG/KG	56-55-3	12 - 21	0.003 - 0.022	0.0082 - 0.04	0.01	0.0082 U	0.0088	0.0069 J	0.013 J	0.003 J	0.0053 J	0.017 J	0.01	0.0094
Benzo(a)pyrene	MG/KG	50-32-8	12 - 21	0.0026 - 0.017	0.0082 - 0.04	0.01	0.0082 U	0.0097	0.0073 J	0.01 J	0.0026 J	0.0047 J	0.011 J	0.0085	0.0089
Benzo(b)fluoranthene	MG/KG	205-99-2	13 - 21	0.0031 - 0.027	0.0082 - 0.04	0.02	0.0082 U	0.011	0.01	0.014 J	0.0031 J	0.0068 J	0.022 J	0.017	0.012
Benzo(ghi)perylene	MG/KG	191-24-2	9 - 21	0.0018 - 0.016	0.0082 - 0.04	0.01	0.0082 U	0.0085	0.0076 J	0.0084 J	0.0018 J	0.0038 J	0.016 J	0.0067 J	0.0074 J
Benzo(k)fluoranthene	MG/KG	207-08-9	6 - 21	0.0031 - 0.0088	0.0078 - 0.04	0.01	0.0082 U	0.0053 J	0.0031 J	0.0052 J	0.0078 U	0.015 U	0.033 U	0.0045 J	0.0052 J
Benzoic Acid	MG/KG	65-85-0	0 - 21	- - -	0.18 - 1		0.21 UJ	0.2 U	0.22 U	0.43 R	0.2 U	0.37 U	0.82 U	0.18 U	0.2 U
Benzyl alcohol	MG/KG	100-51-6	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Biphenyl	MG/KG	92-52-4	8 - 21	0.0026 - 0.024	0.036 - 0.04	0.02	0.04 U	0.038 U	0.0026 J	0.024 J	0.039 U	0.0053 J	0.019 J	0.0035 J	0.0044 J
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 21	- - -	0.0072 - 0.04		0.0082 U	0.0077 U	0.0087 U	0.017 U	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	21 - 21	0.11 - 8.1	- - -	1.64	0.64	0.23 J	1.6	7.6	0.11 J	0.77	8.1	0.5	0.94
Butylbenzylphthalate	MG/KG	85-68-7	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Caprolactam	MG/KG	105-60-2	0 - 21	- - -	0.036 - 1		0.21 U	0.2 U	0.22 U	0.43 U	0.2 U	0.37 U	0.82 U	0.18 U	0.2 U
Carbazole	MG/KG	86-74-8	2 - 21	0.0019 - 0.0035	0.0077 - 0.04	0.01	0.0082 U	0.0077 U	0.0087 U	0.017 U	0.0078 U	0.015 U	0.033 U	0.0019 J	0.008 U
Chrysene	MG/KG	218-01-9	13 - 21	0.0028 - 0.027	0.0082 - 0.04	0.02	0.0082 U	0.01	0.0093	0.018	0.0028 J	0.0056 J	0.019 J	0.016	0.012
Dibenz(a,h)anthracene	MG/KG	53-70-3	5 - 21	0.0021 - 0.0034	0.008 - 0.04	0.01	0.0082 U	0.0034 J	0.0024 J	0.017 U	0.0026 J	0.015 U	0.033 U	0.0027 J	0.0021 J
Dibenzofuran	MG/KG	132-64-9	1 - 21	0.0088 - 0.0088	0.036 - 0.2	0.03	0.04 U	0.038 U	0.043 U	0.0088 J	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Diethylphthalate	MG/KG	84-66-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Dimethylphthalate	MG/KG	131-11-3	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Di-n-butylphthalate	MG/KG	84-74-2	2 - 21	0.018 - 0.021	0.036 - 0.2	0.03	0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.018 J	0.039 U
Di-n-octylphthalate	MG/KG	117-84-0	1 - 21	0.061 - 0.061	0.036 - 0.2	0.03	0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.061
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.04	0.02									
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.04	0.02									
Diphenylmethanone	MG/KG	119-61-9	0 - 10	- - -	0.036 - 0.04										
Fluoranthene	MG/KG	206-44-0	18 - 21	0.0035 - 0.047	0.038 - 0.04	0.02	0.0035 J	0.014	0.014	0.047	0.0047 J	0.0066 J	0.021 J	0.0098	0.014
Fluorene	MG/KG	86-73-7	3 - 21	0.02 - 0.022	0.0072 - 0.04	0.01	0.0082 U	0.0077 U	0.0087 U	0.021	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 21	- - -	0.0072 - 0.04		0.0082 U	0.0077 U	0.0087 U	0.017 U	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 21	- - -	0.0072 - 0.04		0.0082 U	0.0077 U	0.0087 U	0.017 U	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 21	- - -	0.036 - 0.2		0.04 UJ	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Hexachloroethane	MG/KG	67-72-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	9 - 21	0.0017 - 0.017	0.0082 - 0.04	0.01	0.0082 U	0.0073 J	0.006 J	0.0081 J	0.0017 J	0.0032 J	0.017 J	0.0059 J	0.0063 J
Isophorone	MG/KG	78-59-1	0 - 21	- - -	0.036 - 0.2	0.03	0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
Naphthalene	MG/KG	91-20-3	8 - 21	0.0025 - 0.015	0.0077 - 0.11	0.03	0.0025 J	0.0077 U	0.0027 J	0.015 J	0.0078 U	0.0045 J	0.0073 J	0.005 J	0.005 J
Nitrobenzene	MG/KG	98-95-3	0 - 21	- - -	0.036 - 0.4		0.082 U	0.077 U	0.086 U	0.17 U	0.078 U	0.15 U	0.32 U	0.072 U	0.079 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 21	- - -	0.0056 - 0.2		0.04 U	0.038 U	0.043 U	0.084 U	0.039 U	0.072 U	0.16 U	0.036 U	0.039 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 21	- - -	0.0072 - 0.04		0.0082 U	0.0077 U	0.0087 U	0.017 U	0.0078 U	0.015 U	0.033 U	0.0072 U	0.008 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	17 - 22	0.012 - 0.51	0.038 - 0.2	0.10	0.093	0.013 J	0.037 J	0.39	0.039 U	0.052 J	0.51	0.1	0.049
Pentachlorophenol	MG/KG	87-86-5	0 - 21	- - -	0.036 - 1		0.21 U	0.2 U	0.22 U	0.43 UJ	0.2 U	0.37 U	0.82 U	0.18 U	0.2 U
Phenanthrene	MG/KG	85-01-8	11 - 21	0.0024 - 0.084	0.04 - 0.05	0.02	0.0024 J	0.0064 J	0.0081 J	0.084	0.0048 J	0.0045 J	0.016 J	0.0073	0.0083
Phenol	MG/KG	108-95-2	3 - 21	0.013 - 0.33	0.036 - 0.2	0.04	0.04 U	0.038 U	0.043 U	0.33	0.039 U	0.072 U	0.16 U	0.013 J	0.08
Phthalic anhydride	MG/KG	85-44-9	0 - 11	- - -	11 - 13	5.86	12 UJ	11 UJ	13 UJ	12 UJ	11 UJ	11 UJ	12 UJ	11 UJ	12 UJ
Pyrene	MG/KG	129-00-0	15 - 21	0.0042 - 0.047	0.0082 - 0.04	0.02	0.0082 U	0.013	0.012	0.042	0.0042 J	0.0069 J	0.031 J	0.01	0.014
Volatile Organic Compounds															
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 21	- - -	0.0042 - 0.02		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,1-Dichloroethane	MG/KG	75-34-3	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	1 - 21	0.0025 - 0.0025	0.0023 - 0.01	0.002	0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0025 J	0.0064 U	0.0044 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	1 - 21	0.003 - 0.003	0.0023 - 0.01	0.002	0.0043 U	0.0047 U	0.0047 U	0.003 J	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 21	- - -	0.021 - 0.04		0.022 UJ	0.023 U	0.024 U	0.037 U	0.021 U	0.023 U	0.026 U	0.032 U	0.022 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	2 - 21	0.0006 - 0.0014	0.0023 - 0.01	0.002	0.0043 U	0.0047 U	0.0047 U	0.0014 J	0.0042 U	0.0045 U	0.0052 U	0.00063 J	0.0044 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
1,4-Dioxane	MG/KG	123-91-1	0 - 21	- - -	0.21 - 0.37		0.22 UJ	0.23 U	0.24 U	0.37 U	0.21 U	0.23 U	0.26 U	0.32 U	0.22 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	4 - 21	0.0009 - 0.0051	0.0042 - 0.01	0.003	0.0043 UJ	0.0047 U	0.0009 J	0.0051 J	0.0042 U	0.0045 U	0.0052 U	0.0027 J	0.0044 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	2 - 21	0.0009 - 0.0013	0.0042 - 0.01	0.002	0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.00088 J	0.0044 U
2-Butanone	MG/KG	78-93-3	3 - 21	0.0066 - 0.017	0.021 - 0.03	0.01	0.022 U	0.023 U	0.0066 J	0.017 J+	0.021 U	0.023 U	0.015 J	0.032 U	0.022 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
2-Hexanone	MG/KG	591-78-6	0 - 21	- - -	0.021 - 0.04		0.022 UJ	0.023 U	0.024 U	0.037 U	0.021 U	0.023 U	0.026 U	0.032 U	0.022 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
4-iso-Propyltoluene	MG/KG	99-87-6	2 - 21	0.0013 - 0.0019	0.0023 - 0.01	0.002	0.0043 UJ	0.0047 U	0.0047 U	0.0019 J	0.0042 U	0.0045 U	0.0052 U	0.0013 J	0.0044 U

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SB-701 OC-SB-701-0_0/2_0-XXX 11/11/2019 0-2	SB-702 OC-SB-702-0_0/2_0-XXX 11/8/2019 0-2	SB-703 OC-SB-703-0_0/2_0-XXX 11/5/2019 0-2	SB-704 OC-SB-704-0_0/2_0-XXX 11/7/2019 0-2	SB-705 OC-SB-705-0_0/2_0-XXX 11/8/2019 0-2	SB-706 OC-SB-706-0_0/2_0-XXX 11/6/2019 0-2	SB-707 OC-SB-707-0_0/2_0-XXX 11/7/2019 0-2	SB-708 OC-SB-708-0_0/2_0-XXX 11/4/2019 0-2	SB-709 OC-SB-709-0_0/2_0-XXX 11/6/2019 0-2
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 21	- - -	0.021 - 0.04		0.022 U	0.023 U	0.024 U	0.037 U	0.021 U	0.023 U	0.026 U	0.032 U	0.022 U
Acetic acid, methyl ester	MG/KG	79-20-9	0 - 21	- - -	0.042 - 0.07		0.043 UJ	0.047 U	0.047 U	0.073 U	0.042 U	0.045 U	0.052 U	0.064 U	0.044 U
Acetone	MG/KG	67-64-1	7 - 21	0.0058 - 0.093	0.23 - 0.33	0.1	0.014 J-	0.023 J	0.03 J	0.093 J	0.014 J	0.23 U	0.26 U	0.02 J	0.0058 J
Benzene	MG/KG	71-43-2	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Bromobenzene	MG/KG	108-86-1	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Bromochloromethane	MG/KG	74-97-5	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Bromodichloromethane	MG/KG	75-27-4	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Bromoform	MG/KG	75-25-2	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Bromomethane	MG/KG	74-83-9	0 - 21	- - -	0.0042 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Carbon disulfide	MG/KG	75-15-0	1 - 21	0.0039 - 0.0039	0.0023 - 0.01	0.002	0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0039 J	0.0044 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Chlorobenzene	MG/KG	108-90-7	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Chloroethane	MG/KG	75-00-3	0 - 21	- - -	0.0042 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Chloroform	MG/KG	67-66-3	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Chloromethane	MG/KG	74-87-3	0 - 21	- - -	0.0042 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Cyclohexane	MG/KG	110-82-7	0 - 21	- - -	0.021 - 0.04		0.022 U	0.023 U	0.024 U	0.037 U	0.021 U	0.023 U	0.026 U	0.032 U	0.022 U
Dibromochloromethane	MG/KG	124-48-1	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Dibromomethane	MG/KG	74-95-3	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 21	- - -	0.0042 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Diethyl ether	MG/KG	60-29-7	1 - 21	0.0034 - 0.0034	0.0023 - 0.01	0.002	0.0043 U	0.0047 U	0.0047 U	0.0034 J	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Ethylbenzene	MG/KG	100-41-4	1 - 21	0.0004 - 0.00042	0.0023 - 0.01	0.002	0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.00042 J
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Isopropyl ether	MG/KG	108-20-3	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Isopropylbenzene	MG/KG	98-82-8	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Methylene chloride	MG/KG	75-09-2	0 - 21	- - -	0.0044 - 0.03		0.019 U	0.0065 U	0.0047 U	0.014 U	0.0097 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Naphthalene	MG/KG	91-20-3	2 - 21	0.0011 - 0.0025	0.021 - 0.03	0.01	0.022 UJ	0.023 U	0.024 U	0.0025 J	0.021 U	0.023 U	0.026 U	0.0011 J	0.022 U
n-Butylbenzene	MG/KG	104-51-8	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Propylbenzene	MG/KG	103-65-1	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Styrene	MG/KG	100-42-5	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 21	- - -	0.0023 - 0.01		0.0043 UJ	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Tetrachloroethene	MG/KG	127-18-4	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 21	- - -	0.023 - 0.07		0.043 UJ	0.047 U	0.047 U	0.073 U	0.042 U	0.045 U	0.052 U	0.064 U	0.044 U
Toluene	MG/KG	108-88-3	2 - 21	0.0006 - 0.0014	0.0023 - 0.01	0.002	0.0043 U	0.0047 U	0.0047 U	0.0014 J	0.0042 U	0.0045 U	0.0052 U	0.00061 J	0.0044 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Trichloroethene	MG/KG	79-01-6	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 21	- - -	0.0042 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Vinyl chloride	MG/KG	75-01-4	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Xylene, o	MG/KG	95-47-6	0 - 21	- - -	0.0023 - 0.01		0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0044 U
Xylenes (m&p)	MG/KG	179601-23-1	1 - 21	0.0014 - 0.0014	0.0042 - 0.01	0.003	0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0014 J
Xylenes, Total	MG/KG	1330-20-7	1 - 21	0.0014 - 0.0014	0.0042 - 0.01	0.003	0.0043 U	0.0047 U	0.0047 U	0.0073 U	0.0042 U	0.0045 U	0.0052 U	0.0064 U	0.0014 J
Hydrazine/aldehydes															
Acetaldehyde	MG/KG	75-07-0	0 - 5	- - -	0.23 - 0.24										
Formaldehyde	MG/KG	50-00-0	6 - 16	0.096 - 3.2	0.11 - 2.5	1.03	2.5 UJ	2.3 U	1.8 J	2.5 U	1.4 J	2.3 UJ	3.2 J	2.2 UJ	2.4 U
Hydrazine	MG/KG	302-01-2	10 - 16	0.0006 - 0.086	0.0023 - 0.01	0.01	0.0053 J	0.0058 U	0.0067 U	0.086	0.0056 U	0.0054 U	0.0056 J	0.0064	0.0061 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 16	- - -	0.0054 - 0.01		0.0061 U	0.0058 U	0.0067 U	0.007 UJ	0.0056 U	0.0054 U	0.0061 U	0.0062 UJ	0.0061 UJ
UDMH	MG/KG	57-14-7	0 - 16	- - -	0.0054 - 0.01		0.0061 U	0.0058 U	0.0067 U	0.007 U	0.0056 U	0.0054 U	0.0061 U	0.0062 U	0.0061 U

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SB-711 OC-SB-711-0_0/2_0-XXX 11/12/2019 0-2	SB-712 OC-SB-712-0_0/2_0-XXX 11/11/2019 0-2	SS-420 OC-SS-420-0_0/1_0-XXX 9/15/2009 0-1	SS-421 OC-SS-421-0_0/1_0-XXX 9/15/2009 0-1	SS-422 OC-SS-422-0_0/1_0-XXX 9/15/2009 0-1	SS-423 OC-SS-423-0_0/1_0-XXX 9/15/2009 0-1	SS-424 OC-SS-424-0_0/1_0-XXX 9/15/2009 0-1	SS-425 OC-SS-425-0_0/1_0-XXX 9/15/2009 0-1	SS-426 OC-SS-426-0_0/1_0-XXX 9/16/2009 0-1	SS-429 OC-SS-429-0_0/1_0-XXX 9/16/2009 0-1
Dimethylformamide																
Dimethylformamide	MG/KG	68-12-2	0 - 16	- - -	0.16 - 0.84		0.2 U	0.19 U	0.5 U		0.84 U		0.56 U			0.76 U
Inorganics																
Ammonia	MG/KG	7664-41-7	10 - 11	3.8 - 15	7.3 - 7.3	6.97	14	4.4 J								
Chloride	MG/KG	16887-00-6	5 - 21	4.7 - 44	11 - 25	9.46	12 UJ	12 UJ	22 U	25 U	44	18 U	22 U	21 U	17 U	19 U
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37			7.5 U	7.4 U	7.3 U	8.4 U	24	18	6.5 U	8.2 U
Sulfate	MG/KG	14808-79-8	21 - 21	57 - 18000	- - -	4,380.19	1800 J	4000 J	1100	2300	620	57	8100	13000	1000	920
Metals & Inorganics																
Aluminum	MG/KG	7429-90-5	21 - 21	5000 - 9900	- - -	7,652.38	8200	8100	6600	6800	7400	7800	6200	7500	7100	8000
Antimony	MG/KG	7440-36-0	5 - 21	0.63 - 1	0.57 - 20	2.96	0.64 J	18 U	0.57 UJ	0.69 UJ	0.77 UJ	0.74 UJ	0.65 UJ	0.71 UJ	0.59 UJ	0.77 UJ
Arsenic	MG/KG	7440-38-2	21 - 21	3.8 - 33	- - -	11.30	8.1	7.7	9.5	8.4	5.6	12	7.5	8.4	3.8	8.5
Barium	MG/KG	7440-39-3	21 - 21	12 - 89	- - -	50.95	73	61	43	52	81	42	34	51	29	80
Beryllium	MG/KG	7440-41-7	21 - 21	0.24 - 0.5	- - -	0.33	0.34	0.36	0.24	0.25 J	0.27 J	0.29 J	0.33	0.29	0.29	0.28 J
Cadmium	MG/KG	7440-43-9	21 - 21	0.035 - 0.92	- - -	0.35	0.34	0.16 J	0.33	0.34	0.26 J	0.51	0.26	0.42	0.41	0.41
Calcium	MG/KG	7440-70-2	21 - 21	1200 - 110000	- - -	25,604.76	30000	22000	12000	29000	33000	12000	14000	35000	12000	33000
Chromium	MG/KG	7440-47-3	21 - 21	13 - 180	- - -	64.90	95	78	48	52	36	60	55	75	28	87
Chromium, Hexavalent	MG/KG	18540-29-9	10 - 11	0.95 - 5.8	0.46 - 0.46	3.26	5.1	5.5								
Cobalt	MG/KG	7440-48-4	21 - 21	1.9 - 5.8	- - -	4.11	3.9	4.2	3.5	3.5	3.5	4.6	3.8	4.1	5.3	4.1
Copper	MG/KG	7440-50-8	21 - 21	4.5 - 11	- - -	8.40	8.6	11	7.7	7.7	7.8	8.2	7.9	8.3	7.4	8.4
Iron	MG/KG	7439-89-6	21 - 21	6400 - 20000	- - -	10,661.90	9300	9800	9300	9000	8800	13000	9100	10000	13000	10000
Lead	MG/KG	7439-92-1	21 - 21	3.9 - 12	- - -	7.48	8.1	12	5.8	5.3	6	5.7	6.3	6.3	4.5	5.4
Magnesium	MG/KG	7439-95-4	21 - 21	1600 - 4000	- - -	2,738.10	3400	3300	2200	2400	2600	2700	1900	2500	3900	2700
Manganese	MG/KG	7439-96-5	21 - 21	83 - 370	- - -	152.52	160	160	110	110	120	160	100	140	250	130
Mercury	MG/KG	7439-97-6	11 - 21	0.011 - 0.048	0.022 - 0.21	0.06	0.035	0.048	0.14 U	0.2 U	0.16 U	0.21 U	0.21 U	0.15 U	0.18 U	0.21 U
Nickel	MG/KG	7440-02-0	21 - 21	6.1 - 18	- - -	9.50	9.2	10	7.9	8	7.9	9.6	10	8.7	7.5	8.8
Potassium	MG/KG	7440-09-7	21 - 21	650 - 1900	- - -	1,216.19	1200	1500	1900	1400	1500	1100	1100	1400	1600	1500
Selenium	MG/KG	7782-49-2	3 - 21	0.52 - 1.1	0.57 - 5.3	1.20	1.1 J	4.8 U	0.57 U	0.69 U	0.77 U	0.74 U	0.65 U	0.71 U	0.59 U	0.77 U
Silver	MG/KG	7440-22-4	10 - 21	0.13 - 1.2	0.63 - 0.8	0.50	0.76 U	0.73 U	0.42 J	0.61 J	0.35 J	0.63 J	0.76	1	0.13 J	1.2
Sodium	MG/KG	7440-23-5	20 - 21	46 - 440	170 - 170	140.95	140 J	170	79 J	200	440	46 J	62 J	96 J	74 J	250
Thallium	MG/KG	7440-28-0	0 - 21	- - -	1.1 - 8		7.6 U	7.3 U	1.1 U	1.4 U	1.5 U	1.5 U	1.3 U	1.4 U	1.2 U	1.5 U
Tin	MG/KG	7440-31-5	20 - 21	0.52 - 36	2.5 - 2.5	11.08	0.76 J	0.69 J	18 J	20 J	14 J	24 J	22 J	30 J	10 J	36 J
Vanadium	MG/KG	7440-62-2	21 - 21	9.3 - 25	- - -	15.59	16	19	12	13	12	15	12	15	18	14
Zinc	MG/KG	7440-66-6	21 - 21	11 - 30	- - -	20.90	25	25	18	18	17	19	20	20	23	18
Phthalates																
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	- - -	0.11 - 0.12				0.11 U		0.12 U		0.11 U			0.12 U
Semi-Volatile Organic Compounds																
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	5 - 21	0.0022 - 0.068	0.036 - 0.2	0.02	0.0028 J	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
1-Methylnaphthalene	MG/KG	90-12-0	2 - 21	0.0084 - 0.023	0.0072 - 0.04	0.01	0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 21	- - -	0.0072 - 0.04		0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 21	- - -	0.0072 - 0.04		0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,4-Dimethylphenol	MG/KG	105-67-9	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 21	- - -	0.036 - 2		0.4 UJ	2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 21	- - -	0.0072 - 0.04		0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2-Chlorophenol	MG/KG	95-57-8	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2-Methylnaphthalene	MG/KG	91-57-6	2 - 21	0.01 - 0.037	0.0072 - 0.04	0.01	0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2-Methylphenol	MG/KG	95-48-7	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
2-Nitroaniline	MG/KG	88-74-4	0 - 21	- - -	0.18 - 1		0.2 U	1 U	0.18 U	0.21 U	0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U
2-Nitrophenol	MG/KG	88-75-5	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	- - -	0.036 - 0.04				0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.074 U	0.084 U	0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U
3-Nitroaniline	MG/KG	99-09-2	0 - 21	- - -	0.18 - 1		0.2 U	1 U	0.18 U	0.21 U	0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 21	- - -	0.18 - 1		0.2 U	1 U	0.18 U	0.21 U	0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.074 U	0.084 U	0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U
4-Chloroaniline	MG/KG	106-47-8	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.074 U	0.084 U	0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	1 - 21	0.031 - 0.031	0.036 - 0.2	0.03	0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
4-Nitroaniline	MG/KG	100-01-6	0 - 21	- - -	0.18 - 1		0.2 U	1 U	0.18 U	0.21 U	0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U
4-Nitrophenol	MG/KG	100-02-7	0 - 21	- - -	0.18 - 1		0.2 U	1 U	0.18 U	0.21 U	0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U
Acenaphthene	MG/KG	83-32-9	1 - 21	0.016 - 0.016	0.0072 - 0.04	0.01	0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Acenaphthylene	MG/KG	208-96-8	3 - 21	0.0016 - 0.003	0.0077 - 0.04	0.01	0.0018 J	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Acetophenone	MG/KG	98-86-2	3 - 21	0.0034 - 0.0044	0.036 - 0.4	0.04	0.08 U	0.4 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Aniline	MG/KG	62-53-3	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 UJ	0.042 UJ	0.039 UJ	0.039 UJ	0.038 UJ	0.04 UJ	0.036 UJ	0.039 UJ
Anthracene	MG/KG	120-12-7	4 - 21	0.0026 - 0.0091	0.0077 - 0.04	0.01	0.0063 J	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Atrazine	MG/KG	1912-24-9	0 - 21	- - -	0.036 - 0.4		0.08 U	0.4 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Azobenzene	MG/KG	103-33-3	0 - 21	- - -	0.036 - 0.43		0.4 U	0.39 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SB-711 OC-SB-711-0_0/2_0-XXX 11/12/2019 0-2	SB-712 OC-SB-712-0_0/2_0-XXX 11/11/2019 0-2	SS-420 OC-SS-420-0_0/1_0-XXX 9/15/2009 0-1	SS-421 OC-SS-421-0_0/1_0-XXX 9/15/2009 0-1	SS-422 OC-SS-422-0_0/1_0-XXX 9/15/2009 0-1	SS-423 OC-SS-423-0_0/1_0-XXX 9/15/2009 0-1	SS-424 OC-SS-424-0_0/1_0-XXX 9/15/2009 0-1	SS-425 OC-SS-425-0_0/1_0-XXX 9/15/2009 0-1	SS-426 OC-SS-426-0_0/1_0-XXX 9/16/2009 0-1	SS-429 OC-SS-429-0_0/1_0-XXX 9/16/2009 0-1
Benzaldehyde	MG/KG	100-52-7	4 - 21	0.01 - 0.06	0.036 - 0.4	0.05	0.08 R	0.4 U	0.015 J	0.042 U	0.039 U	0.017 J	0.038 U	0.04 U	0.036 U	0.039 U
Benzo(a)anthracene	MG/KG	56-55-3	12 - 21	0.003 - 0.022	0.0082 - 0.04	0.01	0.022	0.011 J	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.019 J
Benzo(a)pyrene	MG/KG	50-32-8	12 - 21	0.0026 - 0.017	0.0082 - 0.04	0.01	0.017	0.04 U	0.011 J	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.014 J
Benzo(b)fluoranthene	MG/KG	205-99-2	13 - 21	0.0031 - 0.027	0.0082 - 0.04	0.02	0.025	0.014 J	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.023 J
Benzo(ghi)perylene	MG/KG	191-24-2	9 - 21	0.0018 - 0.016	0.0082 - 0.04	0.01	0.011	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Benzo(k)fluoranthene	MG/KG	207-08-9	6 - 21	0.0031 - 0.0088	0.0078 - 0.04	0.01	0.0088	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Benzoic Acid	MG/KG	65-85-0	0 - 21	- - -	0.18 - 1		0.2 R	1 U	0.18 U	0.21 U	0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U
Benzyl alcohol	MG/KG	100-51-6	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.074 U	0.084 U	0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U
Biphenyl	MG/KG	92-52-4	8 - 21	0.0026 - 0.024	0.036 - 0.04	0.02	0.0071 J	0.0097 J	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 21	- - -	0.0072 - 0.04		0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	21 - 21	0.11 - 8.1	- - -	1.64	4.9	2.1	0.52 EB	1.6 EB	0.41 EB	0.45 EB	0.38 EB	0.66 EB	0.62 EB	0.33 EB
Butylbenzylphthalate	MG/KG	85-68-7	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Caprolactam	MG/KG	105-60-2	0 - 21	- - -	0.036 - 1		0.2 U	1 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Carbazole	MG/KG	86-74-8	2 - 21	0.0019 - 0.0035	0.0077 - 0.04	0.01	0.0035 J	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Chrysene	MG/KG	218-01-9	13 - 21	0.0028 - 0.027	0.0082 - 0.04	0.02	0.027	0.012 J	0.037 U	0.042 U	0.012 J	0.039 U	0.038 U	0.04 U	0.036 U	0.021 J
Dibenz(a,h)anthracene	MG/KG	53-70-3	5 - 21	0.0021 - 0.0034	0.008 - 0.04	0.01	0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Dibenzofuran	MG/KG	132-64-9	1 - 21	0.0088 - 0.0088	0.036 - 0.2	0.03	0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Diethylphthalate	MG/KG	84-66-2	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Dimethylphthalate	MG/KG	131-11-3	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Di-n-butylphthalate	MG/KG	84-74-2	2 - 21	0.018 - 0.021	0.036 - 0.2	0.03	0.021 J	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Di-n-octylphthalate	MG/KG	117-84-0	1 - 21	0.061 - 0.061	0.036 - 0.2	0.03	0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.04	0.02			0.037 U	0.015 J	0.039 U	0.039 U	0.038 U	0.015 J	0.036 U	0.039 U
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.04	0.02			0.014 J		0.039 U		0.038 U			0.039 U
Diphenylmethanone	MG/KG	119-61-9	0 - 10	- - -	0.036 - 0.04				0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Fluoranthene	MG/KG	206-44-0	18 - 21	0.0035 - 0.047	0.038 - 0.04	0.02	0.046	0.019 J	0.012 J	0.02 J	0.016 J	0.039 U	0.038 U	0.04 U	0.012 J	0.042
Fluorene	MG/KG	86-73-7	3 - 21	0.02 - 0.022	0.0072 - 0.04	0.01	0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.02 J	0.039 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 21	- - -	0.0072 - 0.04		0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 21	- - -	0.0072 - 0.04		0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.074 U	0.084 U	0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U
Hexachloroethane	MG/KG	67-72-1	0 - 21	- - -	0.036 - 0.2		0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	9 - 21	0.0017 - 0.017	0.0082 - 0.04	0.01	0.011	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Isophorone	MG/KG	78-59-1	0 - 21	- - -	0.036 - 0.2	0.03	0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Naphthalene	MG/KG	91-20-3	8 - 21	0.0025 - 0.015	0.0077 - 0.11	0.03	0.0044 J	0.04 U	0.089 U	0.1 U	0.093 U	0.094 U	0.091 U	0.095 U	0.086 U	0.095 U
Nitrobenzene	MG/KG	98-95-3	0 - 21	- - -	0.036 - 0.4		0.08 U	0.4 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 21	- - -	0.0056 - 0.2		0.04 U	0.2 U	0.0056 U	0.042 U	0.0059 U	0.039 U	0.0057 U	0.04 U	0.036 U	0.006 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 21	- - -	0.0072 - 0.04		0.008 U	0.04 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	17 - 22	0.012 - 0.51	0.038 - 0.2	0.10	0.04 U	0.2 U	0.013 JEB	0.033 JEB	0.039 U	0.021 JEB	0.038 U	0.036 JEB	0.014 JEB	0.012 JEB
Pentachlorophenol	MG/KG	87-86-5	0 - 21	- - -	0.036 - 1		0.2 UJ	1 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Phenanthrene	MG/KG	85-01-8	11 - 21	0.0024 - 0.084	0.04 - 0.05	0.02	0.021	0.04 U	0.044 U	0.05 U	0.047 U	0.047 U	0.046 U	0.048 U	0.043 U	0.047 U
Phenol	MG/KG	108-95-2	3 - 21	0.013 - 0.33	0.036 - 0.2	0.04	0.04 U	0.2 U	0.037 U	0.042 U	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U
Phthalic anhydride	MG/KG	85-44-9	0 - 11	- - -	11 - 13	5.86	12 UJ	12 UJ								
Pyrene	MG/KG	129-00-0	15 - 21	0.0042 - 0.047	0.0082 - 0.04	0.02	0.04	0.017 J	0.013 J	0.016 J	0.014 J	0.039 U	0.038 U	0.04 U	0.036 U	0.047
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 21	- - -	0.0042 - 0.02		0.0059 U	0.0046 U	0.011 U	0.015 U	0.014 U	0.012 U	0.012 U	0.012 U	0.012 U	0.016 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,1-Dichloroethane	MG/KG	75-34-3	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	1 - 21	0.0025 - 0.0025	0.0023 - 0.01	0.002	0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	1 - 21	0.003 - 0.003	0.0023 - 0.01	0.002	0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 21	- - -	0.021 - 0.04		0.03 U	0.023 U	0.023 U	0.03 U	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	2 - 21	0.0006 - 0.0014	0.0023 - 0.01	0.002	0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
1,4-Dioxane	MG/KG	123-91-1	0 - 21	- - -	0.21 - 0.37		0.3 U	0.23 U	0.23 UJ	0.3 UJ	0.29 UJ	0.24 UJ	0.25 UJ	0.24 UJ	0.24 UJ	0.33 UJ
2,2-Dichloropropane	MG/KG	594-20-7	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	4 - 21	0.0009 - 0.0051	0.0042 - 0.01	0.003	0.0017 J	0.0046 U	0.0046 U	0.006 U	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	2 - 21	0.0009 - 0.0013	0.0042 - 0.01	0.002	0.0013 J	0.0046 U	0.0046 U	0.006 U	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U
2-Butanone	MG/KG	78-93-3	3 - 21	0.0066 - 0.017	0.021 - 0.03	0.01	0.03 U	0.023 U	0.023 U	0.03 U	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
2-Hexanone	MG/KG	591-78-6	0 - 21	- - -	0.021 - 0.04		0.03 U	0.023 U	0.023 U	0.03 U	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
4-iso-Propyltoluene	MG/KG	99-87-6	2 - 21	0.0013 - 0.0019	0.0023 - 0.01	0.002	0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SB-711 OC-SB-711-0_0/2_0-XXX 11/12/2019 0-2	SB-712 OC-SB-712-0_0/2_0-XXX 11/11/2019 0-2	SS-420 OC-SS-420-0_0/1_0-XXX 9/15/2009 0-1	SS-421 OC-SS-421-0_0/1_0-XXX 9/15/2009 0-1	SS-422 OC-SS-422-0_0/1_0-XXX 9/15/2009 0-1	SS-423 OC-SS-423-0_0/1_0-XXX 9/15/2009 0-1	SS-424 OC-SS-424-0_0/1_0-XXX 9/15/2009 0-1	SS-425 OC-SS-425-0_0/1_0-XXX 9/15/2009 0-1	SS-426 OC-SS-426-0_0/1_0-XXX 9/16/2009 0-1	SS-429 OC-SS-429-0_0/1_0-XXX 9/16/2009 0-1
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 21	- - -	0.021 - 0.04		0.03 U	0.023 U	0.023 U	0.03 U	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U
Acetic acid, methyl ester	MG/KG	79-20-9	0 - 21	- - -	0.042 - 0.07		0.059 U	0.046 U	0.046 U	0.06 U	0.058 U	0.048 U	0.049 U	0.048 U	0.048 U	0.065 U
Acetone	MG/KG	67-64-1	7 - 21	0.0058 - 0.093	0.23 - 0.33	0.1	0.3 U	0.23 U	0.23 UJ	0.3 UJ	0.29 UJ	0.24 UJ	0.25 UJ	0.24 UJ	0.24 UJ	0.33 UJ
Benzene	MG/KG	71-43-2	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Bromobenzene	MG/KG	108-86-1	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Bromochloromethane	MG/KG	74-97-5	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Bromodichloromethane	MG/KG	75-27-4	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Bromoform	MG/KG	75-25-2	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Bromomethane	MG/KG	74-83-9	0 - 21	- - -	0.0042 - 0.01		0.0059 U	0.0046 U	0.0046 U	0.006 U	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Carbon disulfide	MG/KG	75-15-0	1 - 21	0.0039 - 0.0039	0.0023 - 0.01	0.002	0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Chlorobenzene	MG/KG	108-90-7	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Chloroethane	MG/KG	75-00-3	0 - 21	- - -	0.0042 - 0.01		0.0059 U	0.0046 U	0.0046 U	0.006 U	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U
Chloroform	MG/KG	67-66-3	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Chloromethane	MG/KG	74-87-3	0 - 21	- - -	0.0042 - 0.01		0.0059 U	0.0046 U	0.0046 U	0.006 U	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Cyclohexane	MG/KG	110-82-7	0 - 21	- - -	0.021 - 0.04		0.03 U	0.023 U	0.023 U	0.03 U	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U
Dibromochloromethane	MG/KG	124-48-1	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Dibromomethane	MG/KG	74-95-3	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 21	- - -	0.0042 - 0.01		0.0059 U	0.0046 U	0.0046 UJ	0.006 UJ	0.0058 UJ	0.0048 UJ	0.0049 UJ	0.0048 UJ	0.0048 UJ	0.0065 UJ
Diethyl ether	MG/KG	60-29-7	1 - 21	0.0034 - 0.0034	0.0023 - 0.01	0.002	0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Ethylbenzene	MG/KG	100-41-4	1 - 21	0.0004 - 0.00042	0.0023 - 0.01	0.002	0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Isopropyl ether	MG/KG	108-20-3	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Isopropylbenzene	MG/KG	98-82-8	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Methylene chloride	MG/KG	75-09-2	0 - 21	- - -	0.0044 - 0.03		0.026 U	0.027 U	0.0091 U	0.012 U	0.012 U	0.0096 U	0.0099 U	0.0095 U	0.0095 U	0.013 U
Naphthalene	MG/KG	91-20-3	2 - 21	0.0011 - 0.0025	0.021 - 0.03	0.01	0.03 U	0.023 U	0.023 U	0.03 U	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U
n-Butylbenzene	MG/KG	104-51-8	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Propylbenzene	MG/KG	103-65-1	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Styrene	MG/KG	100-42-5	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Tetrachloroethene	MG/KG	127-18-4	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 21	- - -	0.023 - 0.07		0.059 U	0.046 U	0.023 U	0.03 U	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U
Toluene	MG/KG	108-88-3	2 - 21	0.0006 - 0.0014	0.0023 - 0.01	0.002	0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Trichloroethene	MG/KG	79-01-6	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 21	- - -	0.0042 - 0.01		0.0059 U	0.0046 U	0.0046 U	0.006 U	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U
Vinyl chloride	MG/KG	75-01-4	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Xylene, o	MG/KG	95-47-6	0 - 21	- - -	0.0023 - 0.01		0.0059 U	0.0046 U	0.0023 U	0.003 U	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U
Xylenes (m&p)	MG/KG	179601-23-1	1 - 21	0.0014 - 0.0014	0.0042 - 0.01	0.003	0.0059 U	0.0046 U	0.0046 U	0.006 U	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U
Xylenes, Total	MG/KG	1330-20-7	1 - 21	0.0014 - 0.0014	0.0042 - 0.01	0.003	0.0059 U	0.0046 U	0.0046 U	0.006 U	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U
Hydrazine/aldehydes																
Acetaldehyde	MG/KG	75-07-0	0 - 5	- - -	0.23 - 0.24				0.23 UJ		0.24 U		0.23 U			0.24 U
Formaldehyde	MG/KG	50-00-0	6 - 16	0.096 - 3.2	0.11 - 2.5	1.03	2.5 UJ	2.4 UJ	0.11 U		0.096 J		0.11 U			0.17
Hydrazine	MG/KG	302-01-2	10 - 16	0.0006 - 0.086	0.0023 - 0.01	0.01	0.0019 J	0.0038 J	0.0023 U		0.0041		0.002 J			0.00062 J
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 16	- - -	0.0054 - 0.01		0.0059 U	0.0058 U	0.0058 U		0.0058 U		0.0058 U			0.006 U
UDMH	MG/KG	57-14-7	0 - 16	- - -	0.0054 - 0.01		0.0059 U	0.0058 U	0.0058 U		0.0058 U		0.0058 U			0.006 U

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SS-430 OC-SS-430-0_0/1_0-XXX 9/16/2009 0-1	SS-431 OC-SS-431-0_0/1_0-XXX 9/16/2009 0-1
Dimethylformamide								
Dimethylformamide	MG/KG	68-12-2	0 - 16	- - -	0.16 - 0.84			0.69 U
Inorganics								
Ammonia	MG/KG	7664-41-7	10 - 11	3.8 - 15	7.3 - 7.3	6.97		
Chloride	MG/KG	16887-00-6	5 - 21	4.7 - 44	11 - 25	9.46	20 U	15 U
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37	39	20
Sulfate	MG/KG	14808-79-8	21 - 21	57 - 18000	- - -	4,380.19	2400	5100
Metals & Inorganics								
Aluminum	MG/KG	7429-90-5	21 - 21	5000 - 9900	- - -	7,652.38	8000	7800
Antimony	MG/KG	7440-36-0	5 - 21	0.63 - 1	0.57 - 20	2.96	0.86 UJ	0.65 UJ
Arsenic	MG/KG	7440-38-2	21 - 21	3.8 - 33	- - -	11.30	23	8.4
Barium	MG/KG	7440-39-3	21 - 21	12 - 89	- - -	50.95	56	42
Beryllium	MG/KG	7440-41-7	21 - 21	0.24 - 0.5	- - -	0.33	0.31 J	0.29
Cadmium	MG/KG	7440-43-9	21 - 21	0.035 - 0.92	- - -	0.35	0.92	0.79
Calcium	MG/KG	7440-70-2	21 - 21	1200 - 110000	- - -	25,604.76	15000	13000
Chromium	MG/KG	7440-47-3	21 - 21	13 - 180	- - -	64.90	66	59
Chromium, Hexavalent	MG/KG	18540-29-9	10 - 11	0.95 - 5.8	0.46 - 0.46	3.26		
Cobalt	MG/KG	7440-48-4	21 - 21	1.9 - 5.8	- - -	4.11	5.6	4.2
Copper	MG/KG	7440-50-8	21 - 21	4.5 - 11	- - -	8.40	8.4	9.3
Iron	MG/KG	7439-89-6	21 - 21	6400 - 20000	- - -	10,661.90	20000	10000
Lead	MG/KG	7439-92-1	21 - 21	3.9 - 12	- - -	7.48	8.2	7.1
Magnesium	MG/KG	7439-95-4	21 - 21	1600 - 4000	- - -	2,738.10	2100	2700
Manganese	MG/KG	7439-96-5	21 - 21	83 - 370	- - -	152.52	370	140
Mercury	MG/KG	7439-97-6	11 - 21	0.011 - 0.048	0.022 - 0.21	0.06	0.21 U	0.031 J
Nickel	MG/KG	7440-02-0	21 - 21	6.1 - 18	- - -	9.50	9.8	10
Potassium	MG/KG	7440-09-7	21 - 21	650 - 1900	- - -	1,216.19	1000	1100
Selenium	MG/KG	7782-49-2	3 - 21	0.52 - 1.1	0.57 - 5.3	1.20	0.86 U	0.65 U
Silver	MG/KG	7440-22-4	10 - 21	0.13 - 1.2	0.63 - 0.8	0.50	0.67 J	0.7
Sodium	MG/KG	7440-23-5	20 - 21	46 - 440	170 - 170	140.95	77 J	63 J
Thallium	MG/KG	7440-28-0	0 - 21	- - -	1.1 - 8		1.7 U	1.3 U
Tin	MG/KG	7440-31-5	20 - 21	0.52 - 36	2.5 - 2.5	11.08	26 J	24 J
Vanadium	MG/KG	7440-62-2	21 - 21	9.3 - 25	- - -	15.59	17	14
Zinc	MG/KG	7440-66-6	21 - 21	11 - 30	- - -	20.90	19	21
Phthalates								
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	- - -	0.11 - 0.12			0.11 U
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	5 - 21	0.0022 - 0.068	0.036 - 0.2	0.02	0.044 U	0.038 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
1-Methylnaphthalene	MG/KG	90-12-0	2 - 21	0.0084 - 0.023	0.0072 - 0.04	0.01	0.044 U	0.038 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 21	- - -	0.0072 - 0.04		0.044 U	0.038 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 21	- - -	0.0072 - 0.04		0.044 U	0.038 U
2,4-Dimethylphenol	MG/KG	105-67-9	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 21	- - -	0.036 - 2		0.044 U	0.038 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 21	- - -	0.0072 - 0.04		0.044 U	0.038 U
2-Chlorophenol	MG/KG	95-57-8	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
2-Methylnaphthalene	MG/KG	91-57-6	2 - 21	0.01 - 0.037	0.0072 - 0.04	0.01	0.044 U	0.038 U
2-Methylphenol	MG/KG	95-48-7	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
2-Nitroaniline	MG/KG	88-74-4	0 - 21	- - -	0.18 - 1		0.22 U	0.19 U
2-Nitrophenol	MG/KG	88-75-5	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	- - -	0.036 - 0.04		0.044 U	0.038 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 21	- - -	0.036 - 0.2		0.088 U	0.076 U
3-Nitroaniline	MG/KG	99-09-2	0 - 21	- - -	0.18 - 1		0.22 U	0.19 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 21	- - -	0.18 - 1		0.22 U	0.19 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 21	- - -	0.036 - 0.2		0.088 U	0.076 U
4-Chloroaniline	MG/KG	106-47-8	0 - 21	- - -	0.036 - 0.2		0.088 U	0.076 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	1 - 21	0.031 - 0.031	0.036 - 0.2	0.03	0.044 U	0.038 U
4-Nitroaniline	MG/KG	100-01-6	0 - 21	- - -	0.18 - 1		0.22 U	0.19 U
4-Nitrophenol	MG/KG	100-02-7	0 - 21	- - -	0.18 - 1		0.22 U	0.19 U
Acenaphthene	MG/KG	83-32-9	1 - 21	0.016 - 0.016	0.0072 - 0.04	0.01	0.044 U	0.038 U
Acenaphthylene	MG/KG	208-96-8	3 - 21	0.0016 - 0.003	0.0077 - 0.04	0.01	0.044 U	0.038 U
Acetophenone	MG/KG	98-86-2	3 - 21	0.0034 - 0.0044	0.036 - 0.4	0.04	0.044 U	0.038 U
Aniline	MG/KG	62-53-3	0 - 21	- - -	0.036 - 0.2		0.044 UJ	0.038 UJ
Anthracene	MG/KG	120-12-7	4 - 21	0.0026 - 0.0091	0.0077 - 0.04	0.01	0.044 U	0.038 U
Atrazine	MG/KG	1912-24-9	0 - 21	- - -	0.036 - 0.4		0.044 U	0.038 U
Azobenzene	MG/KG	103-33-3	0 - 21	- - -	0.036 - 0.43		0.044 U	0.038 U

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SS-430 OC-SS-430-0_0/1_0-XXX 9/16/2009 0-1	SS-431 OC-SS-431-0_0/1_0-XXX 9/16/2009 0-1
Benzaldehyde	MG/KG	100-52-7	4 - 21	0.01 - 0.06	0.036 - 0.4	0.05	0.06	0.038 U
Benzo(a)anthracene	MG/KG	56-55-3	12 - 21	0.003 - 0.022	0.0082 - 0.04	0.01	0.017 J	0.038 U
Benzo(a)pyrene	MG/KG	50-32-8	12 - 21	0.0026 - 0.017	0.0082 - 0.04	0.01	0.017 J	0.038 U
Benzo(b)fluoranthene	MG/KG	205-99-2	13 - 21	0.0031 - 0.027	0.0082 - 0.04	0.02	0.027 J	0.014 J
Benzo(ghi)perylene	MG/KG	191-24-2	9 - 21	0.0018 - 0.016	0.0082 - 0.04	0.01	0.044 U	0.038 U
Benzo(k)fluoranthene	MG/KG	207-08-9	6 - 21	0.0031 - 0.0088	0.0078 - 0.04	0.01	0.044 U	0.038 U
Benzoic Acid	MG/KG	65-85-0	0 - 21	- - -	0.18 - 1		0.22 U	0.19 U
Benzyl alcohol	MG/KG	100-51-6	0 - 21	- - -	0.036 - 0.2		0.088 U	0.076 U
Biphenyl	MG/KG	92-52-4	8 - 21	0.0026 - 0.024	0.036 - 0.04	0.02	0.044 U	0.038 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 21	- - -	0.0072 - 0.04		0.044 U	0.038 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	21 - 21	0.11 - 8.1	- - -	1.64	0.4 EB	1.5 EB
Butylbenzylphthalate	MG/KG	85-68-7	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
Caprolactam	MG/KG	105-60-2	0 - 21	- - -	0.036 - 1		0.044 U	0.038 U
Carbazole	MG/KG	86-74-8	2 - 21	0.0019 - 0.0035	0.0077 - 0.04	0.01	0.044 U	0.038 U
Chrysene	MG/KG	218-01-9	13 - 21	0.0028 - 0.027	0.0082 - 0.04	0.02	0.021 J	0.038 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	5 - 21	0.0021 - 0.0034	0.008 - 0.04	0.01	0.044 U	0.038 U
Dibenzofuran	MG/KG	132-64-9	1 - 21	0.0088 - 0.0088	0.036 - 0.2	0.03	0.044 U	0.038 U
Diethylphthalate	MG/KG	84-66-2	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
Dimethylphthalate	MG/KG	131-11-3	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
Di-n-butylphthalate	MG/KG	84-74-2	2 - 21	0.018 - 0.021	0.036 - 0.2	0.03	0.044 U	0.038 U
Di-n-octylphthalate	MG/KG	117-84-0	1 - 21	0.061 - 0.061	0.036 - 0.2	0.03	0.044 U	0.038 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.04	0.02	0.044 U	0.038 U
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.04	0.02		0.02 J
Diphenylmethanone	MG/KG	119-61-9	0 - 10	- - -	0.036 - 0.04		0.044 U	0.038 U
Fluoranthene	MG/KG	206-44-0	18 - 21	0.0035 - 0.047	0.038 - 0.04	0.02	0.041 J	0.012 J
Fluorene	MG/KG	86-73-7	3 - 21	0.02 - 0.022	0.0072 - 0.04	0.01	0.044 U	0.022 J
Hexachlorobenzene	MG/KG	118-74-1	0 - 21	- - -	0.0072 - 0.04		0.044 U	0.038 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 21	- - -	0.0072 - 0.04		0.044 U	0.038 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 21	- - -	0.036 - 0.2		0.088 U	0.076 U
Hexachloroethane	MG/KG	67-72-1	0 - 21	- - -	0.036 - 0.2		0.044 U	0.038 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	9 - 21	0.0017 - 0.017	0.0082 - 0.04	0.01	0.044 U	0.038 U
Isophorone	MG/KG	78-59-1	0 - 21	- - -	0.036 - 0.2	0.03	0.044 U	0.038 U
Naphthalene	MG/KG	91-20-3	8 - 21	0.0025 - 0.015	0.0077 - 0.11	0.03	0.11 U	0.091 U
Nitrobenzene	MG/KG	98-95-3	0 - 21	- - -	0.036 - 0.4		0.044 U	0.038 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 21	- - -	0.0056 - 0.2		0.044 U	0.0057 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 21	- - -	0.0072 - 0.04		0.044 U	0.038 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	17 - 22	0.012 - 0.51	0.038 - 0.2	0.10	0.055 EB	0.036 JEB
Pentachlorophenol	MG/KG	87-86-5	0 - 21	- - -	0.036 - 1		0.044 U	0.038 U
Phenanthrene	MG/KG	85-01-8	11 - 21	0.0024 - 0.084	0.04 - 0.05	0.02	0.015 J	0.046 U
Phenol	MG/KG	108-95-2	3 - 21	0.013 - 0.33	0.036 - 0.2	0.04	0.044 U	0.038 U
Phthalic anhydride	MG/KG	85-44-9	0 - 11	- - -	11 - 13	5.86		
Pyrene	MG/KG	129-00-0	15 - 21	0.0042 - 0.047	0.0082 - 0.04	0.02	0.032 J	0.038 U
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 21	- - -	0.0042 - 0.02		0.015 U	0.011 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,1-Dichloroethane	MG/KG	75-34-3	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	1 - 21	0.0025 - 0.0025	0.0023 - 0.01	0.002	0.003 U	0.0023 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	1 - 21	0.003 - 0.003	0.0023 - 0.01	0.002	0.003 U	0.0023 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 21	- - -	0.021 - 0.04		0.03 U	0.023 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	2 - 21	0.0006 - 0.0014	0.0023 - 0.01	0.002	0.003 U	0.0023 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
1,4-Dioxane	MG/KG	123-91-1	0 - 21	- - -	0.21 - 0.37		0.3 UJ	0.23 UJ
2,2-Dichloropropane	MG/KG	594-20-7	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	4 - 21	0.0009 - 0.0051	0.0042 - 0.01	0.003	0.006 U	0.0045 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	2 - 21	0.0009 - 0.0013	0.0042 - 0.01	0.002	0.006 U	0.0045 U
2-Butanone	MG/KG	78-93-3	3 - 21	0.0066 - 0.017	0.021 - 0.03	0.01	0.03 U	0.023 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
2-Hexanone	MG/KG	591-78-6	0 - 21	- - -	0.021 - 0.04		0.03 U	0.023 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
4-iso-Propyltoluene	MG/KG	99-87-6	2 - 21	0.0013 - 0.0019	0.0023 - 0.01	0.002	0.003 U	0.0023 U

Table A-1
Containment Area Soil Analytical Data (0-2FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples (1)	SS-430 OC-SS-430-0_0/1_0-XXX 9/16/2009 0-1	SS-431 OC-SS-431-0_0/1_0-XXX 9/16/2009 0-1
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 21	- - -	0.021 - 0.04		0.03 U	0.023 U
Acetic acid, methyl ester	MG/KG	79-20-9	0 - 21	- - -	0.042 - 0.07		0.06 U	0.045 U
Acetone	MG/KG	67-64-1	7 - 21	0.0058 - 0.093	0.23 - 0.33	0.1	0.3 UJ	0.23 UJ
Benzene	MG/KG	71-43-2	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Bromobenzene	MG/KG	108-86-1	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Bromochloromethane	MG/KG	74-97-5	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Bromodichloromethane	MG/KG	75-27-4	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Bromoform	MG/KG	75-25-2	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Bromomethane	MG/KG	74-83-9	0 - 21	- - -	0.0042 - 0.01		0.006 U	0.0045 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Carbon disulfide	MG/KG	75-15-0	1 - 21	0.0039 - 0.0039	0.0023 - 0.01	0.002	0.003 U	0.0023 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Chlorobenzene	MG/KG	108-90-7	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Chloroethane	MG/KG	75-00-3	0 - 21	- - -	0.0042 - 0.01		0.006 U	0.0045 U
Chloroform	MG/KG	67-66-3	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Chloromethane	MG/KG	74-87-3	0 - 21	- - -	0.0042 - 0.01		0.006 U	0.0045 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Cyclohexane	MG/KG	110-82-7	0 - 21	- - -	0.021 - 0.04		0.03 U	0.023 U
Dibromochloromethane	MG/KG	124-48-1	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Dibromomethane	MG/KG	74-95-3	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 21	- - -	0.0042 - 0.01		0.006 UJ	0.0045 UJ
Diethyl ether	MG/KG	60-29-7	1 - 21	0.0034 - 0.0034	0.0023 - 0.01	0.002	0.003 U	0.0023 U
Ethylbenzene	MG/KG	100-41-4	1 - 21	0.0004 - 0.00042	0.0023 - 0.01	0.002	0.003 U	0.0023 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Isopropyl ether	MG/KG	108-20-3	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Isopropylbenzene	MG/KG	98-82-8	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Methylene chloride	MG/KG	75-09-2	0 - 21	- - -	0.0044 - 0.03		0.012 U	0.0091 U
Naphthalene	MG/KG	91-20-3	2 - 21	0.0011 - 0.0025	0.021 - 0.03	0.01	0.03 U	0.023 U
n-Butylbenzene	MG/KG	104-51-8	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Propylbenzene	MG/KG	103-65-1	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Styrene	MG/KG	100-42-5	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Tetrachloroethene	MG/KG	127-18-4	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 21	- - -	0.023 - 0.07		0.03 U	0.023 U
Toluene	MG/KG	108-88-3	2 - 21	0.0006 - 0.0014	0.0023 - 0.01	0.002	0.003 U	0.0023 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Trichloroethene	MG/KG	79-01-6	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 21	- - -	0.0042 - 0.01		0.006 U	0.0045 U
Vinyl chloride	MG/KG	75-01-4	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Xylene, o	MG/KG	95-47-6	0 - 21	- - -	0.0023 - 0.01		0.003 U	0.0023 U
Xylenes (m&p)	MG/KG	179601-23-1	1 - 21	0.0014 - 0.0014	0.0042 - 0.01	0.003	0.006 U	0.0045 U
Xylenes, Total	MG/KG	1330-20-7	1 - 21	0.0014 - 0.0014	0.0042 - 0.01	0.003	0.006 U	0.0045 U
Hydrazine/aldehydes								
Acetaldehyde	MG/KG	75-07-0	0 - 5	- - -	0.23 - 0.24			0.23 U
Formaldehyde	MG/KG	50-00-0	6 - 16	0.096 - 3.2	0.11 - 2.5	1.03		0.1 J
Hydrazine	MG/KG	302-01-2	10 - 16	0.0006 - 0.086	0.0023 - 0.01	0.01		0.0016 J
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 16	- - -	0.0054 - 0.01			0.0058 U
UDMH	MG/KG	57-14-7	0 - 16	- - -	0.0054 - 0.01			0.0058 U

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Prepared By: mjm 6/2/2020
Checked By: CF 6/3/2020

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-701 OC-SB-701-2_0/4_0-XXX 11/11/2019 2-4	SB-701 OC-SB-701-4_0/6_0-XXX 11/11/2019 4-6	SB-701 OC-SB-701-6_0/8_0-XXX 11/11/2019 6-8	SB-701 OC-SB-701-8_0/10-XXX 11/11/2019 8-10	SB-702 OC-SB-702-2_0/4_0-XXX 11/8/2019 2-4	SB-702 OC-SB-702-4_0/6_0-XXX 11/8/2019 4-6	SB-702 OC-SB-702-6_0/8_0-XXX 11/8/2019 6-8
Dimethylformamide													
Dimethylformamide	MG/KG	68-12-2	0 - 47	- - -	0.14 - 0.23	0.09	0.2 U	0.22 U	0.15 U	0.16 U	0.16 U	0.17 U	0.15 U
Inorganics													
Ammonia	MG/KG	7664-41-7	45 - 47	3.5 - 58	6.6 - 9.9	17.19	28	35	21	27	6	6	7.8
Chloride	MG/KG	16887-00-6	14 - 47	4.1 - 19	10 - 13	6.50	11 UJ	12 UJ	11 UJ	12 UJ	10 UJ	11 UJ	11 UJ
Sulfate	MG/KG	14808-79-8	47 - 47	12 - 16000	- - -	2375.23	15000 J	230 J	130 J	250 J	3000 J	6100 J	730 J
Metals & Inorganics													
Aluminum	MG/KG	7429-90-5	47 - 47	2100 - 15000	- - -	7182.98	7400	4700	4000	3400	9000	11000	10000
Antimony	MG/KG	7440-36-0	12 - 47	0.45 - 1.2	15 - 83	7.31	17 U	18 U	17 U	19 U	16 U	17 U	16 U
Arsenic	MG/KG	7440-38-2	47 - 47	0.76 - 29	- - -	7.21	7.3	0.76 J	1.9 J	3.5	7.6	9.7	11
Barium	MG/KG	7440-39-3	47 - 47	6.6 - 79	- - -	26.13	46	7	7.5	9.9	33	41	41
Beryllium	MG/KG	7440-41-7	47 - 47	0.08 - 0.67	- - -	0.32	0.33	0.16 J	0.18 J	0.16 J	0.44	0.65	0.55
Cadmium	MG/KG	7440-43-9	23 - 47	0.036 - 9.3	0.21 - 0.26	0.43	0.17 J	0.24 U	0.22 U	0.25 U	0.21 U	0.22 U	0.22 U
Calcium	MG/KG	7440-70-2	47 - 47	550 - 44000	- - -	3938.30	44000	2100	1100	1100	3800	2800	2300
Chromium	MG/KG	7440-47-3	47 - 47	5.3 - 1300	- - -	112.08	200	8.1	14	12	20	34	42
Chromium, Hexavalent	MG/KG	18540-29-9	44 - 47	0.18 - 20.8	0.44 - 0.49	2.43	3.7	0.66	0.73	0.98	0.98	0.71	0.55
Cobalt	MG/KG	7440-48-4	47 - 47	0.79 - 13	- - -	4.00	3.5	1.1	1.4	3	4.1	6.5	6
Copper	MG/KG	7440-50-8	47 - 47	0.75 - 27	- - -	9.11	8.2	0.75 J	1.6	2.9	9.3	9.4	12
Iron	MG/KG	7439-89-6	47 - 47	2700 - 23000	- - -	9042.55	8800	3200	3700	4700	9800	13000	13000
Lead	MG/KG	7439-92-1	47 - 47	1.7 - 22	- - -	6.68	7.8	2.5	1.9	1.9	22	7.4	14
Magnesium	MG/KG	7439-95-4	47 - 47	820 - 7300	- - -	2599.57	2400	1000	1200	1200	2600	3900	4500
Manganese	MG/KG	7439-96-5	47 - 47	31 - 310	- - -	117.38	120	50	41	45	130	200	200
Mercury	MG/KG	7439-97-6	19 - 47	0.0086 - 0.19	0.019 - 0.025	0.03	0.069	0.024 U	0.023 U	0.024 U	0.11	0.011 J	0.02 J
Nickel	MG/KG	7440-02-0	47 - 47	2.5 - 40	- - -	12.47	11	4.1 J	5.2 J	6.3	10	23	23
Potassium	MG/KG	7440-09-7	47 - 47	340 - 4300	- - -	1221.28	920	340	400	530	1400	1800	1800
Selenium	MG/KG	7782-49-2	7 - 47	0.5 - 0.79	4.1 - 5.5	2.04	4.4 U	4.9 U	4.4 U	5 U	4.3 U	0.61 J	4.4 U
Silver	MG/KG	7440-22-4	0 - 47	- - -	0.61 - 0.82	0.34	0.66 U	0.73 U	0.67 U	0.75 U	0.64 U	0.66 U	0.65 U
Sodium	MG/KG	7440-23-5	40 - 47	60 - 470	150 - 180	146.68	160	97 J	75 J	73 J	130 J	160	130 J
Thallium	MG/KG	7440-28-0	0 - 47	- - -	6.1 - 8.2		6.6 U	7.3 U	6.7 U	7.5 U	6.4 U	6.6 U	6.5 U
Tin	MG/KG	7440-31-5	26 - 47	0.5 - 1.6	2.1 - 2.7	0.94	1.1 J	2.4 U	2.2 U	2.5 U	0.69 J	0.82 J	1.2 J
Vanadium	MG/KG	7440-62-2	47 - 47	5.2 - 40	- - -	15.93	16	6.1	6	6.6	18	23	22
Zinc	MG/KG	7440-66-6	47 - 47	6.4 - 78	- - -	23.77	27	7	8.4	10	28	28	33
Semi-Volatile Organic Compounds													
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	7 47	0.0017 - 0.023	0.034 - 1.1	0.04	0.0074 J	0.0019 J	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
1-Methylnaphthalene	MG/KG	90-12-0	4 - 47	0.002 - 0.06	0.0069 - 0.072	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 47	- - -	0.0069 - 0.21		0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 47	- - -	0.0069 - 0.21		0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 47	0.0039 - 0.012	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 47	- - -	0.34 - 11		0.38 U	0.39 U	0.38 U	0.4 U	0.35 U	0.37 U	0.75 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 47	- - -	0.0069 - 0.21		0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
2-Chlorophenol	MG/KG	95-57-8	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
2-Methylnaphthalene	MG/KG	91-57-6	5 - 47	0.0019 - 0.1	0.0069 - 0.19	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
2-Methylphenol	MG/KG	95-48-7	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
2-Nitroaniline	MG/KG	88-74-4	0 - 47	- - -	0.18 - 5.4		0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U
2-Nitrophenol	MG/KG	88-75-5	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
3-Nitroaniline	MG/KG	99-09-2	0 - 47	- - -	0.18 - 5.4		0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 47	- - -	0.18 - 5.4		0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 47	0.19 - 0.19	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
4-Chloroaniline	MG/KG	106-47-8	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	1 - 47	0.0064 - 0.0064	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
4-Nitroaniline	MG/KG	100-01-6	0 - 47	- - -	0.18 - 5.4		0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U
4-Nitrophenol	MG/KG	100-02-7	0 - 47	- - -	0.18 - 5.4		0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U
Acenaphthene	MG/KG	83-32-9	2 - 47	0.0055 - 0.017	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.0055 J
Acenaphthylene	MG/KG	208-96-8	4 - 47	0.0017 - 0.0063	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0017 J	0.0075 U	0.0033 J
Acetophenone	MG/KG	98-86-2	3 - 47	0.0044 - 0.0083	0.069 - 2.1	0.09	0.077 U	0.079 U	0.078 U	0.081 U	0.071 U	0.075 U	0.15 U
Aniline	MG/KG	62-53-3	1 - 47	0.017 - 0.017	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Anthracene	MG/KG	120-12-7	9 - 47	0.0021 - 0.06	0.0069 - 0.21	0.01	0.0077 U	0.0021 J	0.0078 U	0.0081 U	0.0022 J	0.0075 U	0.015
Atrazine	MG/KG	1912-24-9	0 - 47	- - -	0.069 - 2.1		0.077 U	0.079 U	0.078 U	0.081 U	0.071 U	0.075 U	0.15 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-701 OC-SB-701-2_0/4_0-XXX 11/11/2019 2-4	SB-701 OC-SB-701-4_0/6_0-XXX 11/11/2019 4-6	SB-701 OC-SB-701-6_0/8_0-XXX 11/11/2019 6-8	SB-701 OC-SB-701-8_0/10-XXX 11/11/2019 8-10	SB-702 OC-SB-702-2_0/4_0-XXX 11/8/2019 2-4	SB-702 OC-SB-702-4_0/6_0-XXX 11/8/2019 4-6	SB-702 OC-SB-702-6_0/8_0-XXX 11/8/2019 6-8
Azobenzene	MG/KG	103-33-3	0 - 47	- - -	0.33 - 7.5		1.9 U	0.4 U	0.38 U	0.39 U	0.35 U	0.37 U	0.36 U
Benzaldehyde	MG/KG	100-52-7	3 - 47	0.0067 - 0.23	0.069 - 2.1	0.09	0.077 U	0.079 U	0.078 U	0.081 U	0.071 R	0.075 R	0.15 R
Benzo(a)anthracene	MG/KG	56-55-3	19 - 47	0.0014 - 0.072	0.0069 - 0.21	0.01	0.0077 U	0.0042 J	0.0078 U	0.0081 U	0.011	0.0039 J	0.049
Benzo(a)pyrene	MG/KG	50-32-8	11 - 47	0.0034 - 0.067	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.01	0.0037 J	0.045
Benzo(b)fluoranthene	MG/KG	205-99-2	16 - 47	0.0021 - 0.068	0.0069 - 0.21	0.01	0.0077 U	0.0032 J	0.0078 U	0.0081 U	0.017	0.0053 J	0.043
Benzo(ghi)perylene	MG/KG	191-24-2	13 - 47	0.0018 - 0.056	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.01	0.0032 J	0.029
Benzo(k)fluoranthene	MG/KG	207-08-9	9 - 47	0.003 - 0.032	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0059 J	0.0075 U	0.02
Benzoic Acid	MG/KG	65-85-0	0 - 47	- - -	0.18 - 5.4		0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U
Benzyl alcohol	MG/KG	100-51-6	1 - 47	0.059 - 0.059	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Biphenyl	MG/KG	92-52-4	13 - 47	0.0017 - 14	0.034 - 1.1	0.44	0.038 U	0.039 U	0.038 U	0.04 U	0.002 J	0.037 U	0.075 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 47	- - -	0.0069 - 0.21		0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	33 - 47	0.043 - 420	0.34 - 0.41	18.26	3.9	0.15 J	0.38 U	0.4 U	0.27 J	3.5	0.8
Butylbenzylphthalate	MG/KG	85-68-7	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Caprolactam	MG/KG	105-60-2	0 - 47	- - -	0.18 - 5.4		0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U
Carbazole	MG/KG	86-74-8	8 - 47	0.0017 - 0.055	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0018 J	0.0075 U	0.0037 J
Chrysene	MG/KG	218-01-9	18 - 47	0.0021 - 0.075	0.0069 - 0.21	0.01	0.0077 U	0.0046 J	0.0078 U	0.0081 U	0.014	0.0045 J	0.046
Dibenz(a,h)anthracene	MG/KG	53-70-3	4 - 47	0.0027 - 0.012	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0027 J	0.0075 U	0.0096 J
Dibenzofuran	MG/KG	132-64-9	2 - 47	0.0094 - 0.029	0.034 - 1.1	0.04	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Diethylphthalate	MG/KG	84-66-2	2 - 47	0.02 - 0.025	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Dimethylphthalate	MG/KG	131-11-3	1 - 47	0.002 - 0.002	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.002 J	0.075 U
Di-n-butylphthalate	MG/KG	84-74-2	3 - 47	0.029 - 2.1	0.034 - 1.1	0.09	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Di-n-octylphthalate	MG/KG	117-84-0	1 - 47	0.023 - 0.023	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Fluoranthene	MG/KG	206-44-0	22 - 47	0.0028 - 0.16	0.0069 - 0.21	0.02	0.0082	0.0063 J	0.0078 U	0.0081 U	0.015	0.0059 J	0.081
Fluorene	MG/KG	86-73-7	4 - 47	0.0019 - 0.012	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.0053 J
Hexachlorobenzene	MG/KG	118-74-1	0 - 47	- - -	0.0069 - 0.21		0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0069 - 0.21		0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Hexachloroethane	MG/KG	67-72-1	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	12 - 47	0.002 - 0.038	0.0069 - 0.21	0.01	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0087	0.0028 J	0.025
Isophorone	MG/KG	78-59-1	0 - 47	- - -	0.034 - 1.1	0.05	0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Naphthalene	MG/KG	91-20-3	16 - 47	0.0014 - 0.54	0.0069 - 0.21	0.02	0.034	0.54	0.0078 U	0.0081 U	0.0014 J	0.0075 U	0.015 U
Nitrobenzene	MG/KG	98-95-3	0 - 47	- - -	0.069 - 2.1		0.077 U	0.079 U	0.077 U	0.08 U	0.07 U	0.075 U	0.15 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 47	- - -	0.034 - 1.1		0.038 U	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 47	- - -	0.0069 - 0.21		0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0071 U	0.0075 U	0.015 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	21 - 47	0.012 - 54	0.034 - 0.075	1.96	0.43	1.5	0.038 U	0.04 U	0.035 U	0.012 J	0.075 U
Pentachlorophenol	MG/KG	87-86-5	0 - 47	- - -	0.18 - 5.4	0.23	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U
Phenanthrene	MG/KG	85-01-8	32 - 47	0.0022 - 0.66	0.007 - 0.21	0.03	0.0065 J	0.0056 J	0.0028 J	0.0081 U	0.0094	0.0045 J	0.048
Phenol	MG/KG	108-95-2	10 - 47	0.011 - 8.8	0.034 - 1.1	0.24	0.023 J	0.039 U	0.038 U	0.04 U	0.035 U	0.037 U	0.075 U
Phthalic anhydride	MG/KG	85-44-9	0 - 47	- - -	10 - 230		56 UJ	12 UJ	11 UJ	12 UJ	10 UJ	11 UJ	11 UJ
Pyrene	MG/KG	129-00-0	23 - 47	0.0017 - 0.15	0.0069 - 0.21	0.02	0.0086	0.0076 J	0.0078 U	0.0081 U	0.014	0.0064 J	0.087
Volatile Organic Compounds													
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,1-Dichloroethane	MG/KG	75-34-3	2 47	0.0007 - 0.00083	0.0037 - 1.9	0.05	0.0046 U	0.0007 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	9 - 47	0.0004 - 0.0019	0.0037 - 1.9	0.05	0.0019 J	0.00054 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	3 - 47	0.0027 - 0.016	0.0037 - 1.9	0.05	0.0038 J	0.016	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 47	- - -	0.018 - 9.3		0.023 U	0.026 U	0.021 U	0.026 U	0.021 U	0.025 U	0.021 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	4 - 47	0.0004 - 0.0011	0.0037 - 1.9	0.05	0.00082 J	0.00079 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 47	0.0003 - 0.00035	0.0037 - 1.9	0.05	0.00032 J	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
1,4-Dioxane	MG/KG	123-91-1	0 - 47	- - -	0.18 - 93		0.23 U	0.26 U	0.21 U	0.26 U	0.21 U	0.25 U	0.21 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	32 - 47	0.0008 - 8	0.0037 - 1.2	0.26	0.059	0.067	0.00076 J	0.0052 U	0.0024 J	0.0012 J	0.013
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	25 - 47	0.0006 - 6.3	0.0037 - 1.2	0.21	0.024	0.034	0.0043 U	0.0052 U	0.00084 J	0.0049 U	0.0044
2-Butanone	MG/KG	78-93-3	23 - 47	0.0044 - 0.56	0.018 - 9.3	0.24	0.021 J+	0.023 J+	0.021 U	0.026 U	0.014 J+	0.029 J+	0.0044 J+
2-Chlorotoluene	MG/KG	95-49-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-701 OC-SB-701-2_0/4_0-XXX 11/11/2019 2-4	SB-701 OC-SB-701-4_0/6_0-XXX 11/11/2019 4-6	SB-701 OC-SB-701-6_0/8_0-XXX 11/11/2019 6-8	SB-701 OC-SB-701-8_0/10-XXX 11/11/2019 8-10	SB-702 OC-SB-702-2_0/4_0-XXX 11/8/2019 2-4	SB-702 OC-SB-702-4_0/6_0-XXX 11/8/2019 4-6	SB-702 OC-SB-702-6_0/8_0-XXX 11/8/2019 6-8
2-Hexanone	MG/KG	591-78-6	0 - 47	- - -	0.018 - 9.3		0.023 U	0.026 U	0.021 U	0.026 U	0.021 U	0.025 U	0.021 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
4-iso-Propyltoluene	MG/KG	99-87-6	6 - 47	0.0004 - 0.42	0.0037 - 1.9	0.04	0.00041 J	0.00048 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 47	- - -	0.018 - 9.3		0.023 U	0.026 U	0.021 U	0.026 U	0.021 U	0.025 U	0.021 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 47	0.0063 - 0.33	0.037 - 19	0.36	0.046 U	0.052 U	0.043 U	0.052 U	0.041 U	0.0081 J	0.042 U
Acetone	MG/KG	67-64-1	31 - 47	0.0042 - 0.099	0.19 - 93	2.24	0.082 J	0.099 J	0.016 J	0.012 J	0.054 J	0.054 J	0.02 J
Benzene	MG/KG	71-43-2	5 - 47	0.0002 - 0.00082	0.0037 - 1.9	0.05	0.0046 U	0.00082 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.00037 J
Bromobenzene	MG/KG	108-86-1	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Bromochloromethane	MG/KG	74-97-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Bromodichloromethane	MG/KG	75-27-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Bromoform	MG/KG	75-25-2	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Bromomethane	MG/KG	74-83-9	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Carbon disulfide	MG/KG	75-15-0	9 - 47	0.0024 - 0.0066	0.0037 - 1.9	0.05	0.0042 J	0.0066	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Chlorobenzene	MG/KG	108-90-7	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Chloroethane	MG/KG	75-00-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Chloroform	MG/KG	67-66-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Chloromethane	MG/KG	74-87-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Cyclohexane	MG/KG	110-82-7	0 - 47	- - -	0.018 - 9.3		0.023 U	0.026 U	0.021 U	0.026 U	0.021 U	0.025 U	0.021 U
Dibromochloromethane	MG/KG	124-48-1	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Dibromomethane	MG/KG	74-95-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Diethyl ether	MG/KG	60-29-7	1 - 47	0.0028 - 0.0028	0.0037 - 1.9	0.05	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Ethylbenzene	MG/KG	100-41-4	6 - 47	0.0003 - 0.37	0.0037 - 1.9	0.04	0.00049 J	0.0014 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Isopropyl ether	MG/KG	108-20-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Isopropylbenzene	MG/KG	98-82-8	4 - 47	0.0012 - 0.2	0.0037 - 1.9	0.04	0.0012 J	0.0037 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Methylene chloride	MG/KG	75-09-2	0 - 47	- - -	0.0037 - 1.9		0.026 U	0.017 U	0.025 U	0.026 U	0.0056 U	0.0084 U	0.0045 U
Naphthalene	MG/KG	91-20-3	6 - 47	0.0009 - 0.18	0.0180 - 9.3	0.18	0.003 J	0.18	0.015 J	0.026 U	0.021 U	0.025 U	0.021 U
n-Butylbenzene	MG/KG	104-51-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Propylbenzene	MG/KG	103-65-1	3 - 47	0.0005 - 0.007	0.0037 - 1.9	0.05	0.0012 J	0.007	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Styrene	MG/KG	100-42-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Tetrachloroethene	MG/KG	127-18-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 47	- - -	0.0370 - 19		0.046 U	0.052 U	0.043 U	0.052 U	0.041 U	0.049 U	0.042 U
Toluene	MG/KG	108-88-3	8 - 47	0.0003 - 0.0042	0.0037 - 1.9	0.05	0.00043 J	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Trichloroethene	MG/KG	79-01-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Vinyl chloride	MG/KG	75-01-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Xylene, o	MG/KG	95-47-6	2 - 47	0.0008 - 0.0016	0.0037 - 1.9	0.05	0.00075 J	0.0016 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Xylenes (m&p)	MG/KG	179601-23-1	6 - 47	0.0008 - 0.0011	0.0037 - 1.9	0.05	0.0046 U	0.00098 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Xylenes, Total	MG/KG	1330-20-7	6 - 47	0.0008 - 0.0026	0.0037 - 1.9	0.05	0.0046 U	0.0026 J	0.0043 U	0.0052 U	0.0041 U	0.0049 U	0.0042 U
Hydrazine/aldehydes													
Formaldehyde	MG/KG	50-00-0	20 - 47	1.3 - 11	2.1 - 2.6	1.81	1.6 J	1.5 J	2.3 UJ	2.4 UJ	1.5 J	2.2 UJ	2.2 UJ
Hydrazine	MG/KG	302-01-2	21 - 47	0.0013 - 0.019	0.01 - 0.007		0.011	0.0028 J	0.0017 J	0.0022 J	0.0015 J	0.0054 U	0.0055 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 47	- - -	0.01 - 0.007		0.006 U	0.006 U	0.0059 U	0.0062 U	0.0053 U	0.0054 U	0.0055 U
UDMH	MG/KG	57-14-7	0 - 47	- - -	0.01 - 0.007		0.006 U	0.006 U	0.0059 U	0.0062 U	0.0053 U	0.0054 U	0.0055 U

MG/KG = milligrams per kilogram
J - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-702 OC-SB-702-8_0/10-XXX 11/8/2019 8-10	SB-703 OC-SB-703-2_0/4_0-XXX 11/5/2019 2-4	SB-703 OC-SB-703-4_0/6_0-XXX 11/5/2019 4-6	SB-703 OC-SB-703-6_0/8_0-XXX 11/5/2019 6-8	SB-703 OC-SB-703-8_0/10-XXX 11/5/2019 8-10	SB-704 OC-SB-704-2_0/4_0-XXX 11/7/2019 2-4	SB-704 OC-SB-704-4_0/6_0-XXX 11/7/2019 4-6	SB-704 OC-SB-704-6_0/8_0-XXX 11/7/2019 6-8	SB-704 OC-SB-704-8_0/10-XXX 11/7/2019 8-10
Dimethylformamide															
Dimethylformamide	MG/KG	68-12-2	0 - 47	- - -	0.14 - 0.23	0.09	0.14 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.18 U	0.15 U	0.18 U
Inorganics															
Ammonia	MG/KG	7664-41-7	45 - 47	3.5 - 58	6.6 - 9.9	17.19	13	12	7.9	10	10	44	40	46	41
Chloride	MG/KG	16887-00-6	14 - 47	4.1 - 19	10 - 13	6.50	10 U	12 U	12 U	5.8 J	9.2 J	11 UJ	11 UJ	11 UJ	4.8 J
Sulfate	MG/KG	14808-79-8	47 - 47	12 - 16000	- - -	2375.23	180	10000	430	180	160	16000 J	760 J	530 J	150 J
Metals & Inorganics															
Aluminum	MG/KG	7429-90-5	47 - 47	2100 - 15000	- - -	7182.98	6300	6500 J+	4700	4600	6100	5600	4800	15000	9200
Antimony	MG/KG	7440-36-0	12 - 47	0.45 - 1.2	15 - 83	7.31	0.55 J	18 U	19 U	18 U	16 U	18 U	16 U	16 U	16 U
Arsenic	MG/KG	7440-38-2	47 - 47	0.76 - 29	- - -	7.21	26	4.1	3.4	7.5	4.2	5.4	4.8	11	7.8
Barium	MG/KG	7440-39-3	47 - 47	6.6 - 79	- - -	26.13	29	12 J-	11 J	10 J	15 J	11	12	79	37
Beryllium	MG/KG	7440-41-7	47 - 47	0.08 - 0.67	- - -	0.32	0.28	0.21 J	0.19 J	0.22 J	0.3	0.27	0.17 J	0.67 J	0.5 J
Cadmium	MG/KG	7440-43-9	23 - 47	0.036 - 9.3	0.21 - 0.26	0.43	0.23 U	0.06 J	0.26 U	0.25 U	0.22 U	0.058 J	0.22 U	0.21 U	0.21 U
Calcium	MG/KG	7440-70-2	47 - 47	550 - 44000	- - -	3938.30	1400	5900 J+	3800	2000	1200	3700	2200	2100	1800
Chromium	MG/KG	7440-47-3	47 - 47	5.3 - 1300	- - -	112.08	22	14 J+	6.8	9.9	52	8.6	13	63	97
Chromium, Hexavalent	MG/KG	18540-29-9	44 - 47	0.18 - 20.8	0.44 - 0.49	2.43	0.44 U	0.7 J	0.29 J	0.37 J	3.2	0.49 U	0.46 U	2.4	5.3
Cobalt	MG/KG	7440-48-4	47 - 47	0.79 - 13	- - -	4.00	7	2.2	2.4	2.4	2.8	2.2	2.3	6.1	4.4
Copper	MG/KG	7440-50-8	47 - 47	0.75 - 27	- - -	9.11	9.5	2.9 J	2.1	2.9	7.3	0.84 J	3.9	14	11
Iron	MG/KG	7439-89-6	47 - 47	2700 - 23000	- - -	9042.55	15000	5000 J+	5200	7900	7600	3800	6200	20000	13000
Lead	MG/KG	7439-92-1	47 - 47	1.7 - 22	- - -	6.68	9.3	3.6	2.3	2.6	3.6	3.1	2.7	5.9	5.2
Magnesium	MG/KG	7439-95-4	47 - 47	820 - 7300	- - -	2599.57	3600	1100 J+	1100	1800	1800	820	1700	5200	3100
Manganese	MG/KG	7439-96-5	47 - 47	31 - 310	- - -	117.38	250	63 J+	61	89	73	31	68	210	130
Mercury	MG/KG	7439-97-6	19 - 47	0.0086 - 0.19	0.019 - 0.025	0.03	0.022 U	0.032	0.024 U	0.025 U	0.022 U	0.023 U	0.022 U	0.021 U	0.02 U
Nickel	MG/KG	7440-02-0	47 - 47	2.5 - 40	- - -	12.47	31	7	4.6 J	7.3	7.5	4.7 J	7.8	18	11
Potassium	MG/KG	7440-09-7	47 - 47	340 - 4300	- - -	1221.28	1500	550	430	580	670	410	640	4300	1700
Selenium	MG/KG	7782-49-2	7 - 47	0.5 - 0.79	4.1 - 5.5	2.04	4.6 U	4.9 U	5.2 U	4.9 U	4.3 U	4.7 U	4.4 U	4.3 U	4.2 U
Silver	MG/KG	7440-22-4	0 - 47	- - -	0.61 - 0.82	0.34	0.68 U	0.73 U	0.77 U	0.74 U	0.65 U	0.71 U	0.66 U	0.64 U	0.64 U
Sodium	MG/KG	7440-23-5	40 - 47	60 - 470	150 - 180	146.68	110 J	170 U	180 U	170 U	150 U	80 J	130 J	280	240
Thallium	MG/KG	7440-28-0	0 - 47	- - -	6.1 - 8.2		6.8 U	7.3 U	7.7 U	7.4 U	6.5 U	7.1 U	6.6 U	6.4 U	6.4 U
Tin	MG/KG	7440-31-5	26 - 47	0.5 - 1.6	2.1 - 2.7	0.94	0.62 J	2.4 U	2.6 U	2.5 U	2.2 U	0.51 J	2.2 U	0.92 J	0.59 J
Vanadium	MG/KG	7440-62-2	47 - 47	5.2 - 40	- - -	15.93	16	8.4	7.8	8.9	12	7.5	9.4	34	21
Zinc	MG/KG	7440-66-6	47 - 47	6.4 - 78	- - -	23.77	26	24	10	11	17	10	13	42	27
Semi-Volatile Organic Compounds															
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	7 47	0.0017 - 0.023	0.034 - 1.1	0.04	0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
1-Methylnaphthalene	MG/KG	90-12-0	4 - 47	0.002 - 0.06	0.0069 - 0.072	0.01	0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.002 J	0.0073 U	0.0072 U	0.0074 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 47	- - -	0.0069 - 0.21		0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 47	- - -	0.0069 - 0.21		0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 47	0.0039 - 0.012	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 47	- - -	0.34 - 11		0.35 U	0.39 UJ	0.4 U	0.41 U	0.36 UJ	0.38 U	0.36 U	0.35 U	0.36 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 47	- - -	0.0069 - 0.21		0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
2-Chlorophenol	MG/KG	95-57-8	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
2-Methylnaphthalene	MG/KG	91-57-6	5 - 47	0.0019 - 0.1	0.0069 - 0.19	0.01	0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0019 J	0.0073 U	0.0023 J	0.0074 U
2-Methylphenol	MG/KG	95-48-7	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
2-Nitroaniline	MG/KG	88-74-4	0 - 47	- - -	0.18 - 5.4		0.18 U	0.2 U	0.21 U	0.21 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U
2-Nitrophenol	MG/KG	88-75-5	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
3-Nitroaniline	MG/KG	99-09-2	0 - 47	- - -	0.18 - 5.4		0.18 U	0.2 U	0.21 U	0.21 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 47	- - -	0.18 - 5.4		0.18 U	0.2 R	0.21 U	0.21 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 47	0.19 - 0.19	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
4-Chloroaniline	MG/KG	106-47-8	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	1 - 47	0.0064 - 0.0064	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.0064 J	0.036 U	0.035 U	0.036 U
4-Nitroaniline	MG/KG	100-01-6	0 - 47	- - -	0.18 - 5.4		0.18 U	0.2 U	0.21 U	0.21 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U
4-Nitrophenol	MG/KG	100-02-7	0 - 47	- - -	0.18 - 5.4		0.18 U	0.2 U	0.21 U	0.21 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U
Acenaphthene	MG/KG	83-32-9	2 - 47	0.0055 - 0.017	0.0069 - 0.21	0.01	0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Acenaphthylene	MG/KG	208-96-8	4 - 47	0.0017 - 0.0063	0.0069 - 0.21	0.01	0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Acetophenone	MG/KG	98-86-2	3 - 47	0.0044 - 0.0083	0.069 - 2.1	0.09	0.071 U	0.079 U	0.082 U	0.084 U	0.073 UJ	0.0057 J	0.073 U	0.072 U	0.074 U
Aniline	MG/KG	62-53-3	1 - 47	0.017 - 0.017	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
Anthracene	MG/KG	120-12-7	9 - 47	0.0021 - 0.06	0.0069 - 0.21	0.01	0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Atrazine	MG/KG	1912-24-9	0 - 47	- - -	0.069 - 2.1		0.071 U	0.079 U	0.082 U	0.084 U	0.073 U	0.076 U	0.073 U	0.072 U	0.074 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-702 OC-SB-702-8_0/10-XXX 11/8/2019 8-10	SB-703 OC-SB-703-2_0/4_0-XXX 11/5/2019 2-4	SB-703 OC-SB-703-4_0/6_0-XXX 11/5/2019 4-6	SB-703 OC-SB-703-6_0/8_0-XXX 11/5/2019 6-8	SB-703 OC-SB-703-8_0/10-XXX 11/5/2019 8-10	SB-704 OC-SB-704-2_0/4_0-XXX 11/7/2019 2-4	SB-704 OC-SB-704-4_0/6_0-XXX 11/7/2019 4-6	SB-704 OC-SB-704-6_0/8_0-XXX 11/7/2019 6-8	SB-704 OC-SB-704-8_0/10-XXX 11/7/2019 8-10
Azobenzene	MG/KG	103-33-3	0 - 47	- - -	0.33 - 7.5		0.35 U	0.4 U	0.41 U	0.41 U	0.36 U	0.37 U	0.37 U	0.36 U	0.34 U
Benzaldehyde	MG/KG	100-52-7	3 - 47	0.0067 - 0.23	0.069 - 2.1	0.09	0.071 U	0.079 R	0.082 U	0.084 U	0.073 R	0.01 J-	0.073 R	0.072 R	0.074 R
Benzo(a)anthracene	MG/KG	56-55-3	19 - 47	0.0014 - 0.072	0.0069 - 0.21	0.01	0.0071 U	0.0035 J	0.0082 U	0.0084 U	0.0073 U	0.0028 J	0.0073 U	0.0072 U	0.0074 U
Benzo(a)pyrene	MG/KG	50-32-8	11 - 47	0.0034 - 0.067	0.0069 - 0.21	0.01	0.0071 U	0.0034 J	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Benzo(b)fluoranthene	MG/KG	205-99-2	16 - 47	0.0021 - 0.068	0.0069 - 0.21	0.01	0.0071 U	0.0041 J	0.0082 U	0.0084 U	0.0073 U	0.0026 J	0.0073 U	0.0072 U	0.0074 U
Benzo(ghi)perylene	MG/KG	191-24-2	13 - 47	0.0018 - 0.056	0.0069 - 0.21	0.01	0.0071 U	0.0037 J	0.0082 U	0.0084 U	0.0073 U	0.0018 J	0.0073 U	0.0072 U	0.0074 U
Benzo(k)fluoranthene	MG/KG	207-08-9	9 - 47	0.003 - 0.032	0.0069 - 0.21	0.01	0.0071 U	0.003 J	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Benzoic Acid	MG/KG	65-85-0	0 - 47	- - -	0.18 - 5.4		0.18 U	0.2 R	0.21 U	0.21 U	0.18 R	0.19 U	0.19 U	0.18 U	0.19 U
Benzyl alcohol	MG/KG	100-51-6	1 - 47	0.059 - 0.059	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Biphenyl	MG/KG	92-52-4	13 - 47	0.0017 - 14	0.034 - 1.1	0.44	0.035 U	0.0032 J	0.04 U	0.041 U	0.036 U	0.0078 J	0.036 U	0.035 U	0.036 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 47	- - -	0.0069 - 0.21		0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 UJ	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	33 - 47	0.043 - 420	0.34 - 0.41	18.26	0.63	0.65 J	0.4 U	0.41 U	0.06 J	2.4	0.36 U	0.35 U	0.36 U
Butylbenzylphthalate	MG/KG	85-68-7	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Caprolactam	MG/KG	105-60-2	0 - 47	- - -	0.18 - 5.4		0.18 U	0.2 U	0.21 U	0.21 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U
Carbazole	MG/KG	86-74-8	8 - 47	0.0017 - 0.055	0.0069 - 0.21	0.01	0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Chrysene	MG/KG	218-01-9	18 - 47	0.0021 - 0.075	0.0069 - 0.21	0.01	0.0071 U	0.0046 J	0.0082 U	0.0084 U	0.0073 U	0.0037 J	0.0073 U	0.0072 U	0.0074 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	4 - 47	0.0027 - 0.012	0.0069 - 0.21	0.01	0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Dibenzofuran	MG/KG	132-64-9	2 - 47	0.0094 - 0.029	0.034 - 1.1	0.04	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Diethylphthalate	MG/KG	84-66-2	2 - 47	0.02 - 0.025	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Dimethylphthalate	MG/KG	131-11-3	1 - 47	0.002 - 0.002	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Di-n-butylphthalate	MG/KG	84-74-2	3 - 47	0.029 - 2.1	0.034 - 1.1	0.09	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Di-n-octylphthalate	MG/KG	117-84-0	1 - 47	0.023 - 0.023	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Fluoranthene	MG/KG	206-44-0	22 - 47	0.0028 - 0.16	0.0069 - 0.21	0.02	0.003 J	0.0063 J	0.0082 U	0.0084 U	0.0073 U	0.0069 J	0.0073 U	0.0072 U	0.0074 U
Fluorene	MG/KG	86-73-7	4 - 47	0.0019 - 0.012	0.0069 - 0.21	0.01	0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0019 J	0.0073 U	0.0072 U	0.0074 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 47	- - -	0.0069 - 0.21		0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0069 - 0.21		0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 UJ	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 UJ	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
Hexachloroethane	MG/KG	67-72-1	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	12 - 47	0.002 - 0.038	0.0069 - 0.21	0.01	0.0071 U	0.003 J	0.0082 U	0.0084 U	0.0073 U	0.002 J	0.0073 U	0.0072 U	0.0074 U
Isophorone	MG/KG	78-59-1	0 - 47	- - -	0.034 - 1.1	0.05	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.038 U	0.036 U	0.035 U	0.036 U
Naphthalene	MG/KG	91-20-3	16 - 47	0.0014 - 0.54	0.0069 - 0.21	0.02	0.0022 J	0.0045 J	0.0082 U	0.0084 U	0.0073 U	0.0024 J	0.0073 U	0.0072 U	0.0074 U
Nitrobenzene	MG/KG	98-95-3	0 - 47	- - -	0.069 - 2.1		0.071 U	0.079 U	0.082 U	0.083 U	0.072 UJ	0.076 U	0.073 U	0.072 U	0.074 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 47	- - -	0.034 - 1.1		0.035 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.038 U	0.036 U	0.035 U	0.036 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 47	- - -	0.0069 - 0.21		0.0071 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	21 - 47	0.012 - 54	0.034 - 0.075	1.96	0.035 U	0.13 J	0.04 U	0.041 U	0.036 U	0.026 J	0.036 U	0.035 U	0.036 U
Pentachlorophenol	MG/KG	87-86-5	0 - 47	- - -	0.18 - 5.4	0.23	0.18 U	0.2 UJ	0.21 U	0.21 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U
Phenanthrene	MG/KG	85-01-8	32 - 47	0.0022 - 0.66	0.007 - 0.21	0.03	0.0071 U	0.0039 J	0.0082 U	0.0084 U	0.0073 U	0.0097	0.0028 J	0.0072 U	0.0074 U
Phenol	MG/KG	108-95-2	10 - 47	0.011 - 8.8	0.034 - 1.1	0.24	0.035 U	0.039 U	0.04 U	0.041 U	0.036 U	0.068	0.042	0.014 J	0.036 U
Phthalic anhydride	MG/KG	85-44-9	0 - 47	- - -	10 - 230		11 UJ	12 UJ	12 UJ	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	10 UJ
Pyrene	MG/KG	129-00-0	23 - 47	0.0017 - 0.15	0.0069 - 0.21	0.02	0.003 J	0.0056 J	0.0082 U	0.0084 U	0.0073 U	0.0063 J	0.0073 U	0.0072 U	0.0074 U
Volatile Organic Compounds															
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1-Dichloroethane	MG/KG	75-34-3	2 47	0.0007 - 0.00083	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	9 - 47	0.0004 - 0.0019	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.00058 J	0.00036 J	0.0037 U	0.0045 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	3 - 47	0.0027 - 0.016	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0027 J	0.0041 U	0.0037 U	0.0045 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 47	- - -	0.018 - 9.3		0.023 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.027 U	0.02 U	0.019 U	0.023 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	4 - 47	0.0004 - 0.0011	0.0037 - 1.9	0.05	0.0046 U	0.00037 J-	0.0046 U	0.005 U	0.005 U	0.0011 J	0.0041 U	0.0037 U	0.0045 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 47	0.0003 - 0.00035	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,4-Dioxane	MG/KG	123-91-1	0 - 47	- - -	0.18 - 93		0.23 U	0.22 UJ	0.23 U	0.25 U	0.25 U	0.27 U	0.2 U	0.19 U	0.23 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	32 - 47	0.0008 - 8	0.0037 - 1.2	0.26	0.016	0.0017 J-	0.0046 U	0.005 U	0.005 U	0.0062	0.0013 J	0.0037 U	0.0045 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	25 - 47	0.0006 - 6.3	0.0037 - 1.2	0.21	0.0031 J	0.00067 J-	0.0046 U	0.005 U	0.005 U	0.003 J	0.00056 J	0.0037 U	0.0045 U
2-Butanone	MG/KG	78-93-3	23 - 47	0.0044 - 0.56	0.018 - 9.3	0.24	0.023 U	0.01 J	0.023 U	0.025 U	0.025 U	0.023 J+	0.064 J+	0.0096 J+	0.029 J+
2-Chlorotoluene	MG/KG	95-49-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-702 OC-SB-702-8_0/10-XXX 11/8/2019 8-10	SB-703 OC-SB-703-2_0/4_0-XXX 11/5/2019 2-4	SB-703 OC-SB-703-4_0/6_0-XXX 11/5/2019 4-6	SB-703 OC-SB-703-6_0/8_0-XXX 11/5/2019 6-8	SB-703 OC-SB-703-8_0/10-XXX 11/5/2019 8-10	SB-704 OC-SB-704-2_0/4_0-XXX 11/7/2019 2-4	SB-704 OC-SB-704-4_0/6_0-XXX 11/7/2019 4-6	SB-704 OC-SB-704-6_0/8_0-XXX 11/7/2019 6-8	SB-704 OC-SB-704-8_0/10-XXX 11/7/2019 8-10
2-Hexanone	MG/KG	591-78-6	0 - 47	- - -	0.018 - 9.3		0.023 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.027 U	0.02 U	0.019 U	0.023 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
4-iso-Propyltoluene	MG/KG	99-87-6	6 - 47	0.0004 - 0.42	0.0037 - 1.9	0.04	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0012 J	0.0041 U	0.0037 U	0.0045 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 47	- - -	0.018 - 9.3		0.023 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.027 U	0.02 U	0.019 U	0.023 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 47	0.0063 - 0.33	0.037 - 19	0.36	0.0063 J	0.044 UJ	0.046 U	0.05 U	0.05 U	0.054 U	0.041 U	0.037 U	0.045 U
Acetone	MG/KG	67-64-1	31 - 47	0.0042 - 0.099	0.19 - 93	2.24	0.0056 J	0.037 J-	0.0065 J	0.023 J	0.0042 J	0.068 J	0.064 J	0.038 J	0.054 J
Benzene	MG/KG	71-43-2	5 - 47	0.0002 - 0.00082	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.00041 J	0.0041 U	0.0037 U	0.0045 U
Bromobenzene	MG/KG	108-86-1	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Bromochloromethane	MG/KG	74-97-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Bromodichloromethane	MG/KG	75-27-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Bromoform	MG/KG	75-25-2	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Bromomethane	MG/KG	74-83-9	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Carbon disulfide	MG/KG	75-15-0	9 - 47	0.0024 - 0.0066	0.0037 - 1.9	0.05	0.0046 U	0.0044 J-	0.0046 U	0.005 U	0.005 U	0.006	0.0025 J	0.0037 U	0.0024 J
Carbon tetrachloride	MG/KG	56-23-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Chlorobenzene	MG/KG	108-90-7	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Chloroethane	MG/KG	75-00-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Chloroform	MG/KG	67-66-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Chloromethane	MG/KG	74-87-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Cyclohexane	MG/KG	110-82-7	0 - 47	- - -	0.018 - 9.3		0.023 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.027 U	0.02 U	0.019 U	0.023 U
Dibromochloromethane	MG/KG	124-48-1	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Dibromomethane	MG/KG	74-95-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Diethyl ether	MG/KG	60-29-7	1 - 47	0.0028 - 0.0028	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0028 J	0.0041 U	0.0037 U	0.0045 U
Ethylbenzene	MG/KG	100-41-4	6 - 47	0.0003 - 0.37	0.0037 - 1.9	0.04	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Isopropyl ether	MG/KG	108-20-3	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Isopropylbenzene	MG/KG	98-82-8	4 - 47	0.0012 - 0.2	0.0037 - 1.9	0.04	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0013 J	0.0041 U	0.0037 U	0.0045 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Methylene chloride	MG/KG	75-09-2	0 - 47	- - -	0.0037 - 1.9		0.02 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.011 U	0.0061 U	0.0047 U	0.0088 U
Naphthalene	MG/KG	91-20-3	6 - 47	0.0009 - 0.18	0.0180 - 9.3	0.18	0.023 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.0014 J	0.02 U	0.019 U	0.023 U
n-Butylbenzene	MG/KG	104-51-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Propylbenzene	MG/KG	103-65-1	3 - 47	0.0005 - 0.007	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.00049 J	0.0041 U	0.0037 U	0.0045 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Styrene	MG/KG	100-42-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Tetrachloroethene	MG/KG	127-18-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 47	- - -	0.0370 - 19		0.046 U	0.044 UJ	0.046 U	0.05 U	0.05 U	0.054 U	0.041 U	0.037 U	0.045 U
Toluene	MG/KG	108-88-3	8 - 47	0.0003 - 0.0042	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0042 J	0.0005 J	0.00038 J	0.0045 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Trichloroethene	MG/KG	79-01-6	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Vinyl chloride	MG/KG	75-01-4	0 - 47	- - -	0.0037 - 1.9		0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Xylene, o	MG/KG	95-47-6	2 - 47	0.0008 - 0.0016	0.0037 - 1.9	0.05	0.0046 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Xylenes (m&p)	MG/KG	179601-23-1	6 - 47	0.0008 - 0.0011	0.0037 - 1.9	0.05	0.0046 U	0.00077 J-	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Xylenes, Total	MG/KG	1330-20-7	6 - 47	0.0008 - 0.0026	0.0037 - 1.9	0.05	0.0046 U	0.00077 J-	0.0046 U	0.005 U	0.005 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Hydrazine/aldehydes															
Formaldehyde	MG/KG	50-00-0	20 - 47	1.3 - 11	2.1 - 2.6	1.81	2.2 UJ	2.9 J	2.5 U	2.5 U	2.2 U	2.7	2.2 U	2.2 U	1.6 J
Hydrazine	MG/KG	302-01-2	21 - 47	0.0013 - 0.019	0.01 - 0.007		0.0021 J	0.0074 J	0.0066 U	0.0058 U	0.0058 U	0.019	0.0013 J	0.0055 U	0.0017 J
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 47	- - -	0.01 - 0.007		0.0054 U	0.0058 U	0.0066 U	0.0058 UJ	0.0058 UJ	0.006 UJ	0.0057 U	0.0055 U	0.0053 U
UDMH	MG/KG	57-14-7	0 - 47	- - -	0.01 - 0.007		0.0054 U	0.0058 U	0.0066 U	0.0058 U	0.0058 U	0.006 U	0.0057 U	0.0055 U	0.0053 U

MG/KG = milligrams per kilogram
J - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-2_0/4_0-XXX 11/8/2019 2-4
Dimethylformamide							
Dimethylformamide	MG/KG	68-12-2	0 - 47	- - -	0.14 - 0.23	0.09	0.17 U
Inorganics							
Ammonia	MG/KG	7664-41-7	45 - 47	3.5 - 58	6.6 - 9.9	17.19	5.8
Chloride	MG/KG	16887-00-6	14 - 47	4.1 - 19	10 - 13	6.50	11 UJ
Sulfate	MG/KG	14808-79-8	47 - 47	12 - 16000	- - -	2375.23	1400 J
Metals & Inorganics							
Aluminum	MG/KG	7429-90-5	47 - 47	2100 - 15000	- - -	7182.98	5400
Antimony	MG/KG	7440-36-0	12 - 47	0.45 - 1.2	15 - 83	7.31	17 U
Arsenic	MG/KG	7440-38-2	47 - 47	0.76 - 29	- - -	7.21	7.1
Barium	MG/KG	7440-39-3	47 - 47	6.6 - 79	- - -	26.13	17
Beryllium	MG/KG	7440-41-7	47 - 47	0.08 - 0.67	- - -	0.32	0.22
Cadmium	MG/KG	7440-43-9	23 - 47	0.036 - 9.3	0.21 - 0.26	0.43	0.26
Calcium	MG/KG	7440-70-2	47 - 47	550 - 44000	- - -	3938.30	1600
Chromium	MG/KG	7440-47-3	47 - 47	5.3 - 1300	- - -	112.08	21
Chromium, Hexavalent	MG/KG	18540-29-9	44 - 47	0.18 - 20.8	0.44 - 0.49	2.43	1.1
Cobalt	MG/KG	7440-48-4	47 - 47	0.79 - 13	- - -	4.00	2.4
Copper	MG/KG	7440-50-8	47 - 47	0.75 - 27	- - -	9.11	5
Iron	MG/KG	7439-89-6	47 - 47	2700 - 23000	- - -	9042.55	6100
Lead	MG/KG	7439-92-1	47 - 47	1.7 - 22	- - -	6.68	6.3
Magnesium	MG/KG	7439-95-4	47 - 47	820 - 7300	- - -	2599.57	1800
Manganese	MG/KG	7439-96-5	47 - 47	31 - 310	- - -	117.38	60
Mercury	MG/KG	7439-97-6	19 - 47	0.0086 - 0.19	0.019 - 0.025	0.03	0.028
Nickel	MG/KG	7440-02-0	47 - 47	2.5 - 40	- - -	12.47	7.6
Potassium	MG/KG	7440-09-7	47 - 47	340 - 4300	- - -	1221.28	970
Selenium	MG/KG	7782-49-2	7 - 47	0.5 - 0.79	4.1 - 5.5	2.04	4.5 U
Silver	MG/KG	7440-22-4	0 - 47	- - -	0.61 - 0.82	0.34	0.67 U
Sodium	MG/KG	7440-23-5	40 - 47	60 - 470	150 - 180	146.68	60 J
Thallium	MG/KG	7440-28-0	0 - 47	- - -	6.1 - 8.2		6.7 U
Tin	MG/KG	7440-31-5	26 - 47	0.5 - 1.6	2.1 - 2.7	0.94	2.2 U
Vanadium	MG/KG	7440-62-2	47 - 47	5.2 - 40	- - -	15.93	10
Zinc	MG/KG	7440-66-6	47 - 47	6.4 - 78	- - -	23.77	25
Semi-Volatile Organic Compounds							
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 47	- - -	0.034 - 1.1		0.11 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	7 47	0.0017 - 0.023	0.034 - 1.1	0.04	0.11 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.034 - 1.1		0.11 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 47	- - -	0.034 - 1.1		0.11 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.034 - 1.1		0.11 U
1-Methylnaphthalene	MG/KG	90-12-0	4 - 47	0.002 - 0.06	0.0069 - 0.072	0.01	0.023 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 47	- - -	0.0069 - 0.21		0.023 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 47	- - -	0.034 - 1.1		0.11 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 47	- - -	0.034 - 1.1		0.11 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 47	- - -	0.034 - 1.1		0.11 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 47	- - -	0.0069 - 0.21		0.023 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 47	0.0039 - 0.012	0.034 - 1.1	0.05	0.11 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 47	- - -	0.34 - 11		1.1 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 47	- - -	0.034 - 1.1		0.11 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 47	- - -	0.034 - 1.1		0.11 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 47	- - -	0.0069 - 0.21		0.023 U
2-Chlorophenol	MG/KG	95-57-8	0 - 47	- - -	0.034 - 1.1		0.11 U
2-Methylnaphthalene	MG/KG	91-57-6	5 - 47	0.0019 - 0.1	0.0069 - 0.19	0.01	0.023 U
2-Methylphenol	MG/KG	95-48-7	0 - 47	- - -	0.034 - 1.1		0.11 U
2-Nitroaniline	MG/KG	88-74-4	0 - 47	- - -	0.18 - 5.4		0.59 U
2-Nitrophenol	MG/KG	88-75-5	0 - 47	- - -	0.034 - 1.1		0.11 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 47	- - -	0.034 - 1.1		0.11 U
3-Nitroaniline	MG/KG	99-09-2	0 - 47	- - -	0.18 - 5.4		0.59 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 47	- - -	0.18 - 5.4		0.59 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 47	0.19 - 0.19	0.034 - 1.1	0.05	0.11 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 47	- - -	0.034 - 1.1		0.11 U
4-Chloroaniline	MG/KG	106-47-8	0 - 47	- - -	0.034 - 1.1		0.11 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	1 - 47	0.0064 - 0.0064	0.034 - 1.1	0.05	0.11 U
4-Nitroaniline	MG/KG	100-01-6	0 - 47	- - -	0.18 - 5.4		0.59 U
4-Nitrophenol	MG/KG	100-02-7	0 - 47	- - -	0.18 - 5.4		0.59 U
Acenaphthene	MG/KG	83-32-9	2 - 47	0.0055 - 0.017	0.0069 - 0.21	0.01	0.023 U
Acenaphthylene	MG/KG	208-96-8	4 - 47	0.0017 - 0.0063	0.0069 - 0.21	0.01	0.023 U
Acetophenone	MG/KG	98-86-2	3 - 47	0.0044 - 0.0083	0.069 - 2.1	0.09	0.23 U
Aniline	MG/KG	62-53-3	1 - 47	0.017 - 0.017	0.034 - 1.1	0.05	0.11 U
Anthracene	MG/KG	120-12-7	9 - 47	0.0021 - 0.06	0.0069 - 0.21	0.01	0.023 U
Atrazine	MG/KG	1912-24-9	0 - 47	- - -	0.069 - 2.1		0.23 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-2_0/4_0-XXX 11/8/2019 2-4
Azobenzene	MG/KG	103-33-3	0 - 47	- - -	0.33 - 7.5		1.8 U
Benzaldehyde	MG/KG	100-52-7	3 - 47	0.0067 - 0.23	0.069 - 2.1	0.09	0.23 J-
Benzo(a)anthracene	MG/KG	56-55-3	19 - 47	0.0014 - 0.072	0.0069 - 0.21	0.01	0.0089 J
Benzo(a)pyrene	MG/KG	50-32-8	11 - 47	0.0034 - 0.067	0.0069 - 0.21	0.01	0.023 U
Benzo(b)fluoranthene	MG/KG	205-99-2	16 - 47	0.0021 - 0.068	0.0069 - 0.21	0.01	0.0082 J
Benzo(ghi)perylene	MG/KG	191-24-2	13 - 47	0.0018 - 0.056	0.0069 - 0.21	0.01	0.0054 J
Benzo(k)fluoranthene	MG/KG	207-08-9	9 - 47	0.003 - 0.032	0.0069 - 0.21	0.01	0.023 U
Benzoic Acid	MG/KG	65-85-0	0 - 47	- - -	0.18 - 5.4		0.59 U
Benzyl alcohol	MG/KG	100-51-6	1 - 47	0.059 - 0.059	0.034 - 1.1	0.05	0.11 U
Biphenyl	MG/KG	92-52-4	13 - 47	0.0017 - 14	0.034 - 1.1	0.44	0.033 J
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 47	- - -	0.034 - 1.1		0.11 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 47	- - -	0.0069 - 0.21		0.023 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	33 - 47	0.043 - 420	0.34 - 0.41	18.26	2.4
Butylbenzylphthalate	MG/KG	85-68-7	0 - 47	- - -	0.034 - 1.1		0.11 U
Caprolactam	MG/KG	105-60-2	0 - 47	- - -	0.18 - 5.4		0.59 U
Carbazole	MG/KG	86-74-8	8 - 47	0.0017 - 0.055	0.0069 - 0.21	0.01	0.023 U
Chrysene	MG/KG	218-01-9	18 - 47	0.0021 - 0.075	0.0069 - 0.21	0.01	0.0076 J
Dibenz(a,h)anthracene	MG/KG	53-70-3	4 - 47	0.0027 - 0.012	0.0069 - 0.21	0.01	0.023 U
Dibenzofuran	MG/KG	132-64-9	2 - 47	0.0094 - 0.029	0.034 - 1.1	0.04	0.11 U
Diethylphthalate	MG/KG	84-66-2	2 - 47	0.02 - 0.025	0.034 - 1.1	0.05	0.11 U
Dimethylphthalate	MG/KG	131-11-3	1 - 47	0.002 - 0.002	0.034 - 1.1	0.05	0.11 U
Di-n-butylphthalate	MG/KG	84-74-2	3 - 47	0.029 - 2.1	0.034 - 1.1	0.09	0.11 U
Di-n-octylphthalate	MG/KG	117-84-0	1 - 47	0.023 - 0.023	0.034 - 1.1	0.05	0.11 U
Fluoranthene	MG/KG	206-44-0	22 - 47	0.0028 - 0.16	0.0069 - 0.21	0.02	0.011 J
Fluorene	MG/KG	86-73-7	4 - 47	0.0019 - 0.012	0.0069 - 0.21	0.01	0.023 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 47	- - -	0.0069 - 0.21		0.023 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0069 - 0.21		0.023 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 47	- - -	0.034 - 1.1		0.11 U
Hexachloroethane	MG/KG	67-72-1	0 - 47	- - -	0.034 - 1.1		0.11 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	12 - 47	0.002 - 0.038	0.0069 - 0.21	0.01	0.023 U
Isophorone	MG/KG	78-59-1	0 - 47	- - -	0.034 - 1.1	0.05	0.11 U
Naphthalene	MG/KG	91-20-3	16 - 47	0.0014 - 0.54	0.0069 - 0.21	0.02	0.0046 J
Nitrobenzene	MG/KG	98-95-3	0 - 47	- - -	0.069 - 2.1		0.23 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 47	- - -	0.034 - 1.1		0.11 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 47	- - -	0.0069 - 0.21		0.023 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	21 - 47	0.012 - 54	0.034 - 0.075	1.96	0.4
Pentachlorophenol	MG/KG	87-86-5	0 - 47	- - -	0.18 - 5.4	0.23	0.59 U
Phenanthrene	MG/KG	85-01-8	32 - 47	0.0022 - 0.66	0.007 - 0.21	0.03	0.0078 J
Phenol	MG/KG	108-95-2	10 - 47	0.011 - 8.8	0.034 - 1.1	0.24	0.11 U
Phthalic anhydride	MG/KG	85-44-9	0 - 47	- - -	10 - 230		56 UJ
Pyrene	MG/KG	129-00-0	23 - 47	0.0017 - 0.15	0.0069 - 0.21	0.02	0.012 J
Volatile Organic Compounds							
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,1-Dichloroethane	MG/KG	75-34-3	2 47	0.0007 - 0.00083	0.0037 - 1.9	0.05	0.0043 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	9 - 47	0.0004 - 0.0019	0.0037 - 1.9	0.05	0.0043 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	3 - 47	0.0027 - 0.016	0.0037 - 1.9	0.05	0.0043 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 47	- - -	0.018 - 9.3		0.022 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	4 - 47	0.0004 - 0.0011	0.0037 - 1.9	0.05	0.0043 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 47	0.0003 - 0.00035	0.0037 - 1.9	0.05	0.0043 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.0037 - 1.9		0.0043 U
1,4-Dioxane	MG/KG	123-91-1	0 - 47	- - -	0.18 - 93		0.22 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 47	- - -	0.0037 - 1.9		0.0043 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	32 - 47	0.0008 - 8	0.0037 - 1.2	0.26	0.0055
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	25 - 47	0.0006 - 6.3	0.0037 - 1.2	0.21	0.0021 J
2-Butanone	MG/KG	78-93-3	23 - 47	0.0044 - 0.56	0.018 - 9.3	0.24	0.014 J+
2-Chlorotoluene	MG/KG	95-49-8	0 - 47	- - -	0.0037 - 1.9		0.0043 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-2_0/4_0-XXX 11/8/2019 2-4
2-Hexanone	MG/KG	591-78-6	0 - 47	- - -	0.018 - 9.3		0.022 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
4-iso-Propyltoluene	MG/KG	99-87-6	6 - 47	0.0004 - 0.42	0.0037 - 1.9	0.04	0.0043 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 47	- - -	0.018 - 9.3		0.022 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 47	0.0063 - 0.33	0.037 - 19	0.36	0.043 U
Acetone	MG/KG	67-64-1	31 - 47	0.0042 - 0.099	0.19 - 93	2.24	0.046 J
Benzene	MG/KG	71-43-2	5 - 47	0.0002 - 0.00082	0.0037 - 1.9	0.05	0.0043 U
Bromobenzene	MG/KG	108-86-1	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Bromochloromethane	MG/KG	74-97-5	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Bromodichloromethane	MG/KG	75-27-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Bromoform	MG/KG	75-25-2	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Bromomethane	MG/KG	74-83-9	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Carbon disulfide	MG/KG	75-15-0	9 - 47	0.0024 - 0.0066	0.0037 - 1.9	0.05	0.0043 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Chlorobenzene	MG/KG	108-90-7	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Chloroethane	MG/KG	75-00-3	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Chloroform	MG/KG	67-66-3	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Chloromethane	MG/KG	74-87-3	0 - 47	- - -	0.0037 - 1.9		0.0043 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 47	- - -	0.0037 - 1.9		0.0043 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Cyclohexane	MG/KG	110-82-7	0 - 47	- - -	0.018 - 9.3		0.022 U
Dibromochloromethane	MG/KG	124-48-1	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Dibromomethane	MG/KG	74-95-3	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Diethyl ether	MG/KG	60-29-7	1 - 47	0.0028 - 0.0028	0.0037 - 1.9	0.05	0.0043 U
Ethylbenzene	MG/KG	100-41-4	6 - 47	0.0003 - 0.37	0.0037 - 1.9	0.04	0.0043 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Isopropyl ether	MG/KG	108-20-3	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Isopropylbenzene	MG/KG	98-82-8	4 - 47	0.0012 - 0.2	0.0037 - 1.9	0.04	0.0043 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Methylene chloride	MG/KG	75-09-2	0 - 47	- - -	0.0037 - 1.9		0.0062 U
Naphthalene	MG/KG	91-20-3	6 - 47	0.0009 - 0.18	0.0180 - 9.3	0.18	0.022 U
n-Butylbenzene	MG/KG	104-51-8	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Propylbenzene	MG/KG	103-65-1	3 - 47	0.0005 - 0.007	0.0037 - 1.9	0.05	0.0043 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Styrene	MG/KG	100-42-5	0 - 47	- - -	0.0037 - 1.9		0.0043 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Tetrachloroethene	MG/KG	127-18-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 47	- - -	0.0370 - 19		0.043 U
Toluene	MG/KG	108-88-3	8 - 47	0.0003 - 0.0042	0.0037 - 1.9	0.05	0.00048 J
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 47	- - -	0.0037 - 1.9		0.0043 U
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Trichloroethene	MG/KG	79-01-6	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Vinyl chloride	MG/KG	75-01-4	0 - 47	- - -	0.0037 - 1.9		0.0043 U
Xylene, o	MG/KG	95-47-6	2 - 47	0.0008 - 0.0016	0.0037 - 1.9	0.05	0.0043 U
Xylenes (m&p)	MG/KG	179601-23-1	6 - 47	0.0008 - 0.0011	0.0037 - 1.9	0.05	0.0043 U
Xylenes, Total	MG/KG	1330-20-7	6 - 47	0.0008 - 0.0026	0.0037 - 1.9	0.05	0.0043 U
Hydrazine/aldehydes							
Formaldehyde	MG/KG	50-00-0	20 - 47	1.3 - 11	2.1 - 2.6	1.81	2.2 U
Hydrazine	MG/KG	302-01-2	21 - 47	0.0013 - 0.019	0.01 - 0.007		0.0056 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 47	- - -	0.01 - 0.007		0.0056 U
UDMH	MG/KG	57-14-7	0 - 47	- - -	0.01 - 0.007		0.0056 U

MG/KG = milligrams per kilogram
J - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-4_0/6_0-XXX 11/8/2019 4-6	SB-705 OC-SB-705-6_0/8_0-XXX 11/8/2019 6-8	SB-705 OC-SB-705-8_0/10-XXX 11/8/2019 8-10	SB-706 OC-SB-706-2_0/4_0-XXX 11/6/2019 2-4	SB-706 OC-SB-706-4_0/6_0-XXX 11/6/2019 4-6	SB-706 OC-SB-706-6_0/8_0-XXX 11/6/2019 6-8	SB-707 OC-SB-707-2_0/4_0-XXX 11/7/2019 2-4	SB-707 OC-SB-707-4_0/6_0-XXX 11/7/2019 4-6	SB-707 OC-SB-707-6_0/8_0-XXX 11/7/2019 6-8
Dimethylformamide															
Dimethylformamide	MG/KG	68-12-2	0 - 47	- - -	0.14 - 0.23	0.09	0.2 U	0.15 U	0.2 U	0.18 U	0.16 U	0.17 U	0.22 U	0.16 U	0.15 U
Inorganics															
Ammonia	MG/KG	7664-41-7	45 - 47	3.5 - 58	6.6 - 9.9	17.19	7.5	8.2	29	14	9.6	12	13	6.5	5.6 J-
Chloride	MG/KG	16887-00-6	14 - 47	4.1 - 19	10 - 13	6.50	13 U	11 U	11 U	11 UJ	7 J	4.8 J	11 UJ	11 UJ	4.1 J
Sulfate	MG/KG	14808-79-8	47 - 47	12 - 16000	- - -	2375.23	3400 J	160	190	410 J	120 J	160 J	2100 J	7100 J	130 J
Metals & Inorganics															
Aluminum	MG/KG	7429-90-5	47 - 47	2100 - 15000	- - -	7182.98	5900 J+	3700	5800	13000	9000	11000	14000	6400	7400 J+
Antimony	MG/KG	7440-36-0	12 - 47	0.45 - 1.2	15 - 83	7.31	20 U	17 U	16 U	1.1 J	0.95 J	83 U	1.2 J	15 U	0.65 J-
Arsenic	MG/KG	7440-38-2	47 - 47	0.76 - 29	- - -	7.21	6.6	6.5	4.4	7.6	6.2	17	29	5	3.6
Barium	MG/KG	7440-39-3	47 - 47	6.6 - 79	- - -	26.13	16	9.3	23	43	34	41	55	16	26
Beryllium	MG/KG	7440-41-7	47 - 47	0.08 - 0.67	- - -	0.32	0.23 J	0.14 J	0.34 J	0.39	0.35	0.48	0.62	0.32	0.4
Cadmium	MG/KG	7440-43-9	23 - 47	0.036 - 9.3	0.21 - 0.26	0.43	0.45	0.23 U	0.21 U	0.22 U	0.23 U	0.22 U	0.22 U	0.051 J	0.22 U
Calcium	MG/KG	7440-70-2	47 - 47	550 - 44000	- - -	3938.30	3600 J+	1200	1800	3500	1700	3800	3700	7000	2400
Chromium	MG/KG	7440-47-3	47 - 47	5.3 - 1300	- - -	112.08	77 J	410	250	200	890	1300	44	120	83 J-
Chromium, Hexavalent	MG/KG	18540-29-9	44 - 47	0.18 - 20.8	0.44 - 0.49	2.43	1.5 J	7.4	9.9	2.9	6.6	20.8	1	7.6	3.4
Cobalt	MG/KG	7440-48-4	47 - 47	0.79 - 13	- - -	4.00	2.9	2.1	3.9	9.1	4.4	6.8	13	3.2	3.2
Copper	MG/KG	7440-50-8	47 - 47	0.75 - 27	- - -	9.11	5.5	5	11	27	11	25	22	12	11
Iron	MG/KG	7439-89-6	47 - 47	2700 - 23000	- - -	9042.55	7700 J+	4900	9000	16000	12000	23000	19000	7700	9500
Lead	MG/KG	7439-92-1	47 - 47	1.7 - 22	- - -	6.68	7.9	2.2	3.2	8.2	5.6	21	14	4.8	5.5
Magnesium	MG/KG	7439-95-4	47 - 47	820 - 7300	- - -	2599.57	1900	920	2500	6200	2700	4200	6400	3200	2500
Manganese	MG/KG	7439-96-5	47 - 47	31 - 310	- - -	117.38	98 J+	55	100	210	130	180	310	150	160 J+
Mercury	MG/KG	7439-97-6	19 - 47	0.0086 - 0.19	0.019 - 0.025	0.03	0.026 J	0.022 U	0.022 U	0.09	0.022 U	0.022 U	0.022 U	0.0086 J	0.022 U
Nickel	MG/KG	7440-02-0	47 - 47	2.5 - 40	- - -	12.47	8.1	4.7 J	11	23	12	17	40	13	8.9
Potassium	MG/KG	7440-09-7	47 - 47	340 - 4300	- - -	1221.28	700	380	950	2000	1500	2000	2700	750	1400
Selenium	MG/KG	7782-49-2	7 - 47	0.5 - 0.79	4.1 - 5.5	2.04	5.5 U	0.79 J	4.3 U	4.4 U	4.6 U	4.4 U	4.4 U	4.1 U	4.4 U
Silver	MG/KG	7440-22-4	0 - 47	- - -	0.61 - 0.82	0.34	0.82 U	0.68 U	0.64 U	0.66 U	0.68 U	0.66 U	0.66 U	0.62 U	0.66 U
Sodium	MG/KG	7440-23-5	40 - 47	60 - 470	150 - 180	146.68	67 J	69 J	140 J	220	210	330	170	130 J	240
Thallium	MG/KG	7440-28-0	0 - 47	- - -	6.1 - 8.2		8.2 U	6.8 U	6.4 U	6.6 U	6.8 U	6.6 U	6.6 U	6.2 U	6.6 U
Tin	MG/KG	7440-31-5	26 - 47	0.5 - 1.6	2.1 - 2.7	0.94	0.69 J	2.3 U	2.1 U	0.78 J	2.3 U	0.81 J	0.84 J	2.1 U	0.57 J
Vanadium	MG/KG	7440-62-2	47 - 47	5.2 - 40	- - -	15.93	12	7	16	40	19	35	33	15	17 J
Zinc	MG/KG	7440-66-6	47 - 47	6.4 - 78	- - -	23.77	22	7.5	18	27	23	46	43	16	21
Semi-Volatile Organic Compounds															
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	7 47	0.0017 - 0.023	0.034 - 1.1	0.04	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.0017 J	0.035 U	0.034 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
1-Methylnaphthalene	MG/KG	90-12-0	4 - 47	0.002 - 0.06	0.0069 - 0.072	0.01	0.06 J	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 47	- - -	0.0069 - 0.21		0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 47	- - -	0.0069 - 0.21		0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 47	0.0039 - 0.012	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 47	- - -	0.34 - 11		11 U	0.37 U	0.35 U	3.5 U	0.36 U	0.72 U	0.36 U	0.35 U	0.34 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 47	- - -	0.0069 - 0.21		0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
2-Chlorophenol	MG/KG	95-57-8	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
2-Methylnaphthalene	MG/KG	91-57-6	5 - 47	0.0019 - 0.1	0.0069 - 0.19	0.01	0.1 J	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
2-Methylphenol	MG/KG	95-48-7	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
2-Nitroaniline	MG/KG	88-74-4	0 - 47	- - -	0.18 - 5.4		5.4 U	0.19 U	0.18 U	1.8 U	0.18 U	0.37 U	0.19 U	0.18 U	0.18 U
2-Nitrophenol	MG/KG	88-75-5	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
3-Nitroaniline	MG/KG	99-09-2	0 - 47	- - -	0.18 - 5.4		5.4 U	0.19 U	0.18 U	1.8 U	0.18 U	0.37 U	0.19 U	0.18 U	0.18 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 47	- - -	0.18 - 5.4		5.4 U	0.19 U	0.18 U	1.8 U	0.18 U	0.37 U	0.19 U	0.18 U	0.18 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 47	0.19 - 0.19	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.19 J	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
4-Chloroaniline	MG/KG	106-47-8	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	1 - 47	0.0064 - 0.0064	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
4-Nitroaniline	MG/KG	100-01-6	0 - 47	- - -	0.18 - 5.4		5.4 U	0.19 U	0.18 U	1.8 U	0.18 U	0.37 U	0.19 U	0.18 U	0.18 U
4-Nitrophenol	MG/KG	100-02-7	0 - 47	- - -	0.18 - 5.4		5.4 U	0.19 U	0.18 U	1.8 U	0.18 U	0.37 U	0.19 U	0.18 U	0.18 U
Acenaphthene	MG/KG	83-32-9	2 - 47	0.0055 - 0.017	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Acenaphthylene	MG/KG	208-96-8	4 - 47	0.0017 - 0.0063	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Acetophenone	MG/KG	98-86-2	3 - 47	0.0044 - 0.0083	0.069 - 2.1	0.09	2.1 U	0.076 U	0.072 U	0.72 U	0.072 U	0.15 U	0.073 U	0.072 U	0.069 U
Aniline	MG/KG	62-53-3	1 - 47	0.017 - 0.017	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Anthracene	MG/KG	120-12-7	9 - 47	0.0021 - 0.06	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Atrazine	MG/KG	1912-24-9	0 - 47	- - -	0.069 - 2.1		2.1 U	0.076 U	0.072 U	0.72 U	0.072 U	0.15 U	0.073 U	0.072 U	0.069 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-4_0/6_0-XXX 11/8/2019 4-6	SB-705 OC-SB-705-6_0/8_0-XXX 11/8/2019 6-8	SB-705 OC-SB-705-8_0/10-XXX 11/8/2019 8-10	SB-706 OC-SB-706-2_0/4_0-XXX 11/6/2019 2-4	SB-706 OC-SB-706-4_0/6_0-XXX 11/6/2019 4-6	SB-706 OC-SB-706-6_0/8_0-XXX 11/6/2019 6-8	SB-707 OC-SB-707-2_0/4_0-XXX 11/7/2019 2-4	SB-707 OC-SB-707-4_0/6_0-XXX 11/7/2019 4-6	SB-707 OC-SB-707-6_0/8_0-XXX 11/7/2019 6-8
Azobenzene	MG/KG	103-33-3	0 - 47	- - -	0.33 - 7.5		2.1 U	0.37 U	0.36 U	3.6 U	0.36 U	0.35 U	0.36 U	0.36 U	0.35 U
Benzaldehyde	MG/KG	100-52-7	3 - 47	0.0067 - 0.23	0.069 - 2.1	0.09	2.1 U	0.076 U	0.072 U	0.72 R	0.072 R	0.15 R	0.073 R	0.072 R	0.069 R
Benzo(a)anthracene	MG/KG	56-55-3	19 - 47	0.0014 - 0.072	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0014 J	0.0072 U	0.0069 U
Benzo(a)pyrene	MG/KG	50-32-8	11 - 47	0.0034 - 0.067	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Benzo(b)fluoranthene	MG/KG	205-99-2	16 - 47	0.0021 - 0.068	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Benzo(ghi)perylene	MG/KG	191-24-2	13 - 47	0.0018 - 0.056	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Benzo(k)fluoranthene	MG/KG	207-08-9	9 - 47	0.003 - 0.032	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Benzoic Acid	MG/KG	65-85-0	0 - 47	- - -	0.18 - 5.4		5.4 U	0.19 U	0.18 U	1.8 U	0.18 U	0.37 U	0.19 U	0.18 U	0.18 R
Benzyl alcohol	MG/KG	100-51-6	1 - 47	0.059 - 0.059	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Biphenyl	MG/KG	92-52-4	13 - 47	0.0017 - 14	0.034 - 1.1	0.44	1.1 U	0.037 U	0.035 U	5.5	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 47	- - -	0.0069 - 0.21		0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	33 - 47	0.043 - 420	0.34 - 0.41	18.26	2.1 J	0.37 U	0.35 U	370	0.17 J	0.21 J	0.5	2.4	0.34 U
Butylbenzylphthalate	MG/KG	85-68-7	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Caprolactam	MG/KG	105-60-2	0 - 47	- - -	0.18 - 5.4		5.4 U	0.19 U	0.18 U	1.8 U	0.18 U	0.37 U	0.19 U	0.18 U	0.18 U
Carbazole	MG/KG	86-74-8	8 - 47	0.0017 - 0.055	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.055 J	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Chrysene	MG/KG	218-01-9	18 - 47	0.0021 - 0.075	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	4 - 47	0.0027 - 0.012	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Dibenzofuran	MG/KG	132-64-9	2 - 47	0.0094 - 0.029	0.034 - 1.1	0.04	1.1 U	0.037 U	0.035 U	0.029 J	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Diethylphthalate	MG/KG	84-66-2	2 - 47	0.02 - 0.025	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Dimethylphthalate	MG/KG	131-11-3	1 - 47	0.002 - 0.002	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Di-n-butylphthalate	MG/KG	84-74-2	3 - 47	0.029 - 2.1	0.034 - 1.1	0.09	1.1 U	0.037 U	0.035 U	2.1	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Di-n-octylphthalate	MG/KG	117-84-0	1 - 47	0.023 - 0.023	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.023 J	0.034 U
Fluoranthene	MG/KG	206-44-0	22 - 47	0.0028 - 0.16	0.0069 - 0.21	0.02	0.21 U	0.0076 U	0.0072 U	0.046 J	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Fluorene	MG/KG	86-73-7	4 - 47	0.0019 - 0.012	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 47	- - -	0.0069 - 0.21		0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0069 - 0.21		0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Hexachloroethane	MG/KG	67-72-1	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	12 - 47	0.002 - 0.038	0.0069 - 0.21	0.01	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Isophorone	MG/KG	78-59-1	0 - 47	- - -	0.034 - 1.1	0.05	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Naphthalene	MG/KG	91-20-3	16 - 47	0.0014 - 0.54	0.0069 - 0.21	0.02	0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
Nitrobenzene	MG/KG	98-95-3	0 - 47	- - -	0.069 - 2.1		2.1 U	0.076 U	0.072 U	0.71 U	0.072 U	0.15 U	0.073 U	0.072 U	0.069 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 47	- - -	0.034 - 1.1		1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 47	- - -	0.0069 - 0.21		0.21 U	0.0076 U	0.0072 U	0.072 U	0.0072 U	0.015 U	0.0073 U	0.0072 U	0.0069 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	21 - 47	0.012 - 54	0.034 - 0.075	1.96	2.7	0.037 U	0.035 U	28 J	0.036 U	0.025 J	0.018 J	0.035 U	0.034 U
Pentachlorophenol	MG/KG	87-86-5	0 - 47	- - -	0.18 - 5.4	0.23	5.4 U	0.19 U	0.18 U	1.8 U	0.18 U	0.37 U	0.19 U	0.18 U	0.18 U
Phenanthrene	MG/KG	85-01-8	32 - 47	0.0022 - 0.66	0.007 - 0.21	0.03	0.21 U	0.0076 U	0.0072 U	0.15	0.0045 J	0.0045 J	0.0033 J	0.0026 J	0.0025 J
Phenol	MG/KG	108-95-2	10 - 47	0.011 - 8.8	0.034 - 1.1	0.24	1.1 U	0.037 U	0.035 U	0.35 U	0.036 U	0.072 U	0.036 U	0.035 U	0.034 U
Phthalic anhydride	MG/KG	85-44-9	0 - 47	- - -	10 - 230		65 UJ	11 UJ	11 UJ	110 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ
Pyrene	MG/KG	129-00-0	23 - 47	0.0017 - 0.15	0.0069 - 0.21	0.02	0.21 U	0.0076 U	0.0072 U	0.068 J	0.0072 U	0.015 U	0.0017 J	0.0072 U	0.0069 U
Volatile Organic Compounds															
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 UJ
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,1-Dichloroethane	MG/KG	75-34-3	2 47	0.0007 - 0.00083	0.0037 - 1.9	0.05	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.00083 J	0.0042 U	0.0038 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 UJ
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 UJ
1,2,4-Trichlorobenzene	MG/KG	120-82-1	9 - 47	0.0004 - 0.0019	0.0037 - 1.9	0.05	0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0014 J	0.0042 U	0.0038 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	3 - 47	0.0027 - 0.016	0.0037 - 1.9	0.05	0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 47	- - -	0.018 - 9.3		0.024 UJ	0.021 U	0.019 U	0.021 U	0.019 U	0.019 U	0.02 U	0.021 U	0.019 UJ
1,2-Dibromoethane	MG/KG	106-93-4	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 UJ
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	4 - 47	0.0004 - 0.0011	0.0037 - 1.9	0.05	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 47	0.0003 - 0.00035	0.0037 - 1.9	0.05	0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 UJ
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
1,4-Dioxane	MG/KG	123-91-1	0 - 47	- - -	0.18 - 93		0.24 U	0.21 U	0.19 U	0.21 U	0.19 U	0.19 U	0.2 U	0.21 U	0.19 UJ
2,2-Dichloropropane	MG/KG	594-20-7	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	32 - 47	0.0008 - 8	0.0037 - 1.2	0.26	0.0074 J-	0.0043 U	0.0037 U	0.0013 J	0.0019 J	0.0037 U	0.0063	0.001 J	0.0038 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	25 - 47	0.0006 - 6.3	0.0037 - 1.2	0.21	0.0023 J-	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0035 J	0.0042 U	0.0038 U
2-Butanone	MG/KG	78-93-3	23 - 47	0.0044 - 0.56	0.018 - 9.3	0.24	0.02 J+	0.56 J+	0.019 U	0.015 J+	0.0082 J	0.019 U	0.021 J+	0.021 U	0.019 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-4_0/6_0-XXX 11/8/2019 4-6	SB-705 OC-SB-705-6_0/8_0-XXX 11/8/2019 6-8	SB-705 OC-SB-705-8_0/10-XXX 11/8/2019 8-10	SB-706 OC-SB-706-2_0/4_0-XXX 11/6/2019 2-4	SB-706 OC-SB-706-4_0/6_0-XXX 11/6/2019 4-6	SB-706 OC-SB-706-6_0/8_0-XXX 11/6/2019 6-8	SB-707 OC-SB-707-2_0/4_0-XXX 11/7/2019 2-4	SB-707 OC-SB-707-4_0/6_0-XXX 11/7/2019 4-6	SB-707 OC-SB-707-6_0/8_0-XXX 11/7/2019 6-8
2-Hexanone	MG/KG	591-78-6	0 - 47	- - -	0.018 - 9.3		0.024 UJ	0.021 U	0.019 U	0.021 U	0.019 U	0.019 U	0.02 U	0.021 U	0.019 UJ
4-Chlorotoluene	MG/KG	106-43-4	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
4-iso-Propyltoluene	MG/KG	99-87-6	6 - 47	0.0004 - 0.42	0.0037 - 1.9	0.04	0.00052 J-	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 47	- - -	0.018 - 9.3		0.024 UJ	0.021 U	0.019 U	0.021 U	0.019 U	0.019 U	0.02 U	0.021 U	0.019 UJ
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 47	0.0063 - 0.33	0.037 - 19	0.36	0.048 UJ	0.041 J	0.037 U	0.042 U	0.039 U	0.037 U	0.039 U	0.042 U	0.038 UJ
Acetone	MG/KG	67-64-1	31 - 47	0.0042 - 0.099	0.19 - 93	2.24	0.074 J-	0.018 J	0.19 U	0.21 U	0.19 U	0.19 U	0.2 U	0.21 U	0.19 UJ
Benzene	MG/KG	71-43-2	5 - 47	0.0002 - 0.00082	0.0037 - 1.9	0.05	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0002 J	0.0042 U	0.0038 U
Bromobenzene	MG/KG	108-86-1	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Bromochloromethane	MG/KG	74-97-5	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Bromodichloromethane	MG/KG	75-27-4	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Bromoform	MG/KG	75-25-2	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Bromomethane	MG/KG	74-83-9	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Carbon disulfide	MG/KG	75-15-0	9 - 47	0.0024 - 0.0066	0.0037 - 1.9	0.05	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Chlorobenzene	MG/KG	108-90-7	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Chloroethane	MG/KG	75-00-3	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Chloroform	MG/KG	67-66-3	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Chloromethane	MG/KG	74-87-3	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Cyclohexane	MG/KG	110-82-7	0 - 47	- - -	0.018 - 9.3		0.024 U	0.021 U	0.019 U	0.021 U	0.019 U	0.019 U	0.02 U	0.021 U	0.019 U
Dibromochloromethane	MG/KG	124-48-1	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Dibromomethane	MG/KG	74-95-3	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Diethyl ether	MG/KG	60-29-7	1 - 47	0.0028 - 0.0028	0.0037 - 1.9	0.05	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Ethylbenzene	MG/KG	100-41-4	6 - 47	0.0003 - 0.37	0.0037 - 1.9	0.04	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 UJ
Isopropyl ether	MG/KG	108-20-3	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Isopropylbenzene	MG/KG	98-82-8	4 - 47	0.0012 - 0.2	0.0037 - 1.9	0.04	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Methylene chloride	MG/KG	75-09-2	0 - 47	- - -	0.0037 - 1.9		0.0073 U	0.029 U	0.026 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Naphthalene	MG/KG	91-20-3	6 - 47	0.0009 - 0.18	0.0180 - 9.3	0.18	0.024 UJ	0.021 U	0.019 U	0.021 U	0.019 U	0.019 U	0.02 U	0.021 U	0.019 UJ
n-Butylbenzene	MG/KG	104-51-8	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Propylbenzene	MG/KG	103-65-1	3 - 47	0.0005 - 0.007	0.0037 - 1.9	0.05	0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Styrene	MG/KG	100-42-5	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 47	- - -	0.0037 - 1.9		0.0048 UJ	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Tetrachloroethene	MG/KG	127-18-4	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 47	- - -	0.0370 - 19		0.048 UJ	0.043 U	0.037 U	0.042 U	0.039 U	0.037 U	0.039 U	0.042 U	0.038 UJ
Toluene	MG/KG	108-88-3	8 - 47	0.0003 - 0.0042	0.0037 - 1.9	0.05	0.0006 J	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.00041 J	0.0042 U	0.0038 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Trichloroethene	MG/KG	79-01-6	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Vinyl chloride	MG/KG	75-01-4	0 - 47	- - -	0.0037 - 1.9		0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Xylene, o	MG/KG	95-47-6	2 - 47	0.0008 - 0.0016	0.0037 - 1.9	0.05	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Xylenes (m&p)	MG/KG	179601-23-1	6 - 47	0.0008 - 0.0011	0.0037 - 1.9	0.05	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Xylenes, Total	MG/KG	1330-20-7	6 - 47	0.0008 - 0.0026	0.0037 - 1.9	0.05	0.0048 U	0.0043 U	0.0037 U	0.0042 U	0.0039 U	0.0037 U	0.0039 U	0.0042 U	0.0038 U
Hydrazine/aldehydes															
Formaldehyde	MG/KG	50-00-0	20 - 47	1.3 - 11	2.1 - 2.6	1.81	5.4 J	1.5 J	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	1.3 J
Hydrazine	MG/KG	302-01-2	21 - 47	0.0013 - 0.019	0.01 - 0.007		0.0017 J	0.0055 U	0.0058 U	0.0057 U	0.0056 U	0.0055 U	0.002 J	0.0093	0.0027 J
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 47	- - -	0.01 - 0.007		0.0058 UJ	0.0055 U	0.0058 U	0.0057 U	0.0056 U	0.0055 U	0.0058 U	0.0054 U	0.0053 U
UDMH	MG/KG	57-14-7	0 - 47	- - -	0.01 - 0.007		0.0058 U	0.0055 U	0.0058 U	0.0057 U	0.0056 U	0.0055 U	0.0058 U	0.0054 U	0.0053 U

MG/KG = milligrams per kilogram
J - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-707 OC-SB-707-8_0/10-XXX 11/7/2019 8-10
Dimethylformamide							
Dimethylformamide	MG/KG	68-12-2	0 - 47	- - -	0.14 - 0.23	0.09	0.14 U
Inorganics							
Ammonia	MG/KG	7664-41-7	45 - 47	3.5 - 58	6.6 - 9.9	17.19	7.5
Chloride	MG/KG	16887-00-6	14 - 47	4.1 - 19	10 - 13	6.50	9.9 J
Sulfate	MG/KG	14808-79-8	47 - 47	12 - 16000	- - -	2375.23	190
Metals & Inorganics							
Aluminum	MG/KG	7429-90-5	47 - 47	2100 - 15000	- - -	7182.98	7700
Antimony	MG/KG	7440-36-0	12 - 47	0.45 - 1.2	15 - 83	7.31	0.5 J
Arsenic	MG/KG	7440-38-2	47 - 47	0.76 - 29	- - -	7.21	2.4
Barium	MG/KG	7440-39-3	47 - 47	6.6 - 79	- - -	26.13	25
Beryllium	MG/KG	7440-41-7	47 - 47	0.08 - 0.67	- - -	0.32	0.38
Cadmium	MG/KG	7440-43-9	23 - 47	0.036 - 9.3	0.21 - 0.26	0.43	0.23 U
Calcium	MG/KG	7440-70-2	47 - 47	550 - 44000	- - -	3938.30	3300
Chromium	MG/KG	7440-47-3	47 - 47	5.3 - 1300	- - -	112.08	72
Chromium, Hexavalent	MG/KG	18540-29-9	44 - 47	0.18 - 20.8	0.44 - 0.49	2.43	4.2
Cobalt	MG/KG	7440-48-4	47 - 47	0.79 - 13	- - -	4.00	3.8
Copper	MG/KG	7440-50-8	47 - 47	0.75 - 27	- - -	9.11	9.6
Iron	MG/KG	7439-89-6	47 - 47	2700 - 23000	- - -	9042.55	7800
Lead	MG/KG	7439-92-1	47 - 47	1.7 - 22	- - -	6.68	4.3
Magnesium	MG/KG	7439-95-4	47 - 47	820 - 7300	- - -	2599.57	2500
Manganese	MG/KG	7439-96-5	47 - 47	31 - 310	- - -	117.38	120
Mercury	MG/KG	7439-97-6	19 - 47	0.0086 - 0.19	0.019 - 0.025	0.03	0.021 U
Nickel	MG/KG	7440-02-0	47 - 47	2.5 - 40	- - -	12.47	9.8
Potassium	MG/KG	7440-09-7	47 - 47	340 - 4300	- - -	1221.28	1300
Selenium	MG/KG	7782-49-2	7 - 47	0.5 - 0.79	4.1 - 5.5	2.04	4.5 U
Silver	MG/KG	7440-22-4	0 - 47	- - -	0.61 - 0.82	0.34	0.68 U
Sodium	MG/KG	7440-23-5	40 - 47	60 - 470	150 - 180	146.68	370
Thallium	MG/KG	7440-28-0	0 - 47	- - -	6.1 - 8.2		6.8 U
Tin	MG/KG	7440-31-5	26 - 47	0.5 - 1.6	2.1 - 2.7	0.94	0.5 J
Vanadium	MG/KG	7440-62-2	47 - 47	5.2 - 40	- - -	15.93	15
Zinc	MG/KG	7440-66-6	47 - 47	6.4 - 78	- - -	23.77	15
Semi-Volatile Organic Compounds							
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 47	- - -	0.034 - 1.1		0.036 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	7 47	0.0017 - 0.023	0.034 - 1.1	0.04	0.036 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.034 - 1.1		0.036 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 47	- - -	0.034 - 1.1		0.036 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.034 - 1.1		0.036 U
1-Methylnaphthalene	MG/KG	90-12-0	4 - 47	0.002 - 0.06	0.0069 - 0.072	0.01	0.0072 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 47	- - -	0.0069 - 0.21		0.0072 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 47	- - -	0.034 - 1.1		0.036 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 47	- - -	0.034 - 1.1		0.036 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 47	- - -	0.034 - 1.1		0.036 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 47	- - -	0.0069 - 0.21		0.0072 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 47	0.0039 - 0.012	0.034 - 1.1	0.05	0.036 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 47	- - -	0.34 - 11		0.36 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 47	- - -	0.034 - 1.1		0.036 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 47	- - -	0.034 - 1.1		0.036 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 47	- - -	0.0069 - 0.21		0.0072 U
2-Chlorophenol	MG/KG	95-57-8	0 - 47	- - -	0.034 - 1.1		0.036 U
2-Methylnaphthalene	MG/KG	91-57-6	5 - 47	0.0019 - 0.1	0.0069 - 0.19	0.01	0.0072 U
2-Methylphenol	MG/KG	95-48-7	0 - 47	- - -	0.034 - 1.1		0.036 U
2-Nitroaniline	MG/KG	88-74-4	0 - 47	- - -	0.18 - 5.4		0.18 U
2-Nitrophenol	MG/KG	88-75-5	0 - 47	- - -	0.034 - 1.1		0.036 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 47	- - -	0.034 - 1.1		0.036 U
3-Nitroaniline	MG/KG	99-09-2	0 - 47	- - -	0.18 - 5.4		0.18 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 47	- - -	0.18 - 5.4		0.18 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 47	0.19 - 0.19	0.034 - 1.1	0.05	0.036 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 47	- - -	0.034 - 1.1		0.036 U
4-Chloroaniline	MG/KG	106-47-8	0 - 47	- - -	0.034 - 1.1		0.036 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	1 - 47	0.0064 - 0.0064	0.034 - 1.1	0.05	0.036 U
4-Nitroaniline	MG/KG	100-01-6	0 - 47	- - -	0.18 - 5.4		0.18 U
4-Nitrophenol	MG/KG	100-02-7	0 - 47	- - -	0.18 - 5.4		0.18 U
Acenaphthene	MG/KG	83-32-9	2 - 47	0.0055 - 0.017	0.0069 - 0.21	0.01	0.0072 U
Acenaphthylene	MG/KG	208-96-8	4 - 47	0.0017 - 0.0063	0.0069 - 0.21	0.01	0.0072 U
Acetophenone	MG/KG	98-86-2	3 - 47	0.0044 - 0.0083	0.069 - 2.1	0.09	0.072 U
Aniline	MG/KG	62-53-3	1 - 47	0.017 - 0.017	0.034 - 1.1	0.05	0.036 U
Anthracene	MG/KG	120-12-7	9 - 47	0.0021 - 0.06	0.0069 - 0.21	0.01	0.0072 U
Atrazine	MG/KG	1912-24-9	0 - 47	- - -	0.069 - 2.1		0.072 U

Table A-2
Containment Area Soil Analytical Data (2-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-707 OC-SB-707-8_0/10-XXX 11/7/2019 8-10
Azobenzene	MG/KG	103-33-3	0 - 47	- - -	0.33 - 7.5		0.36 U
Benzaldehyde	MG/KG	100-52-7	3 - 47	0.0067 - 0.23	0.069 - 2.1	0.09	0.072 R
Benzo(a)anthracene	MG/KG	56-55-3	19 - 47	0.0014 - 0.072	0.0069 - 0.21	0.01	0.0072 U
Benzo(a)pyrene	MG/KG	50-32-8	11 - 47	0.0034 - 0.067	0.0069 - 0.21	0.01	0.0072 U
Benzo(b)fluoranthene	MG/KG	205-99-2	16 - 47	0.0021 - 0.068	0.0069 - 0.21	0.01	0.0072 U
Benzo(ghi)perylene	MG/KG	191-24-2	13 - 47	0.0018 - 0.056	0.0069 - 0.21	0.01	0.0072 U
Benzo(k)fluoranthene	MG/KG	207-08-9	9 - 47	0.003 - 0.032	0.0069 - 0.21	0.01	0.0072 U
Benzoic Acid	MG/KG	65-85-0	0 - 47	- - -	0.18 - 5.4		0.18 U
Benzyl alcohol	MG/KG	100-51-6	1 - 47	0.059 - 0.059	0.034 - 1.1	0.05	0.036 U
Biphenyl	MG/KG	92-52-4	13 - 47	0.0017 - 14	0.034 - 1.1	0.44	0.036 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 47	- - -	0.034 - 1.1		0.036 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 47	- - -	0.0069 - 0.21		0.0072 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	33 - 47	0.043 - 420	0.34 - 0.41	18.26	0.36 U
Butylbenzylphthalate	MG/KG	85-68-7	0 - 47	- - -	0.034 - 1.1		0.036 U
Caprolactam	MG/KG	105-60-2	0 - 47	- - -	0.18 - 5.4		0.18 U
Carbazole	MG/KG	86-74-8	8 - 47	0.0017 - 0.055	0.0069 - 0.21	0.01	0.0072 U
Chrysene	MG/KG	218-01-9	18 - 47	0.0021 - 0.075	0.0069 - 0.21	0.01	0.0072 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	4 - 47	0.0027 - 0.012	0.0069 - 0.21	0.01	0.0072 U
Dibenzofuran	MG/KG	132-64-9	2 - 47	0.0094 - 0.029	0.034 - 1.1	0.04	0.036 U
Diethylphthalate	MG/KG	84-66-2	2 - 47	0.02 - 0.025	0.034 - 1.1	0.05	0.036 U
Dimethylphthalate	MG/KG	131-11-3	1 - 47	0.002 - 0.002	0.034 - 1.1	0.05	0.036 U
Di-n-butylphthalate	MG/KG	84-74-2	3 - 47	0.029 - 2.1	0.034 - 1.1	0.09	0.036 U
Di-n-octylphthalate	MG/KG	117-84-0	1 - 47	0.023 - 0.023	0.034 - 1.1	0.05	0.036 U
Fluoranthene	MG/KG	206-44-0	22 - 47	0.0028 - 0.16	0.0069 - 0.21	0.02	0.0072 U
Fluorene	MG/KG	86-73-7	4 - 47	0.0019 - 0.012	0.0069 - 0.21	0.01	0.0072 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 47	- - -	0.0069 - 0.21		0.0072 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0069 - 0.21		0.0072 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 47	- - -	0.034 - 1.1		0.036 U
Hexachloroethane	MG/KG	67-72-1	0 - 47	- - -	0.034 - 1.1		0.036 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	12 - 47	0.002 - 0.038	0.0069 - 0.21	0.01	0.0072 U
Isophorone	MG/KG	78-59-1	0 - 47	- - -	0.034 - 1.1	0.05	0.036 U
Naphthalene	MG/KG	91-20-3	16 - 47	0.0014 - 0.54	0.0069 - 0.21	0.02	0.0072 U
Nitrobenzene	MG/KG	98-95-3	0 - 47	- - -	0.069 - 2.1		0.072 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 47	- - -	0.034 - 1.1		0.036 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 47	- - -	0.0069 - 0.21		0.0072 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	21 - 47	0.012 - 54	0.034 - 0.075	1.96	0.036 U
Pentachlorophenol	MG/KG	87-86-5	0 - 47	- - -	0.18 - 5.4	0.23	0.18 U
Phenanthrene	MG/KG	85-01-8	32 - 47	0.0022 - 0.66	0.007 - 0.21	0.03	0.0072 U
Phenol	MG/KG	108-95-2	10 - 47	0.011 - 8.8	0.034 - 1.1	0.24	0.036 U
Phthalic anhydride	MG/KG	85-44-9	0 - 47	- - -	10 - 230		11 UJ
Pyrene	MG/KG	129-00-0	23 - 47	0.0017 - 0.15	0.0069 - 0.21	0.02	0.0072 U
Volatile Organic Compounds							
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,1-Dichloroethane	MG/KG	75-34-3	2 47	0.0007 - 0.00083	0.0037 - 1.9	0.05	0.0039 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	9 - 47	0.0004 - 0.0019	0.0037 - 1.9	0.05	0.0039 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	3 - 47	0.0027 - 0.016	0.0037 - 1.9	0.05	0.0039 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 47	- - -	0.018 - 9.3		0.019 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	4 - 47	0.0004 - 0.0011	0.0037 - 1.9	0.05	0.0039 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 47	0.0003 - 0.00035	0.0037 - 1.9	0.05	0.0039 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 47	- - -	0.0037 - 1.9		0.0039 U
1,4-Dioxane	MG/KG	123-91-1	0 - 47	- - -	0.18 - 93		0.19 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 47	- - -	0.0037 - 1.9		0.0039 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	32 - 47	0.0008 - 8	0.0037 - 1.2	0.26	0.0039 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	25 - 47	0.0006 - 6.3	0.0037 - 1.2	0.21	0.0039 U
2-Butanone	MG/KG	78-93-3	23 - 47	0.0044 - 0.56	0.018 - 9.3	0.24	0.019 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 47	- - -	0.0037 - 1.9		0.0039 U

Table A-2
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Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-707 OC-SB-707-8_0/10-XXX 11/7/2019 8-10
2-Hexanone	MG/KG	591-78-6	0 - 47	- - -	0.018 - 9.3		0.019 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
4-iso-Propyltoluene	MG/KG	99-87-6	6 - 47	0.0004 - 0.42	0.0037 - 1.9	0.04	0.0039 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 47	- - -	0.018 - 9.3		0.019 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 47	0.0063 - 0.33	0.037 - 19	0.36	0.039 U
Acetone	MG/KG	67-64-1	31 - 47	0.0042 - 0.099	0.19 - 93	2.24	0.19 U
Benzene	MG/KG	71-43-2	5 - 47	0.0002 - 0.00082	0.0037 - 1.9	0.05	0.0039 U
Bromobenzene	MG/KG	108-86-1	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Bromochloromethane	MG/KG	74-97-5	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Bromodichloromethane	MG/KG	75-27-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Bromoform	MG/KG	75-25-2	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Bromomethane	MG/KG	74-83-9	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Carbon disulfide	MG/KG	75-15-0	9 - 47	0.0024 - 0.0066	0.0037 - 1.9	0.05	0.0039 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Chlorobenzene	MG/KG	108-90-7	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Chloroethane	MG/KG	75-00-3	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Chloroform	MG/KG	67-66-3	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Chloromethane	MG/KG	74-87-3	0 - 47	- - -	0.0037 - 1.9		0.0039 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 47	- - -	0.0037 - 1.9		0.0039 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Cyclohexane	MG/KG	110-82-7	0 - 47	- - -	0.018 - 9.3		0.019 U
Dibromochloromethane	MG/KG	124-48-1	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Dibromomethane	MG/KG	74-95-3	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Diethyl ether	MG/KG	60-29-7	1 - 47	0.0028 - 0.0028	0.0037 - 1.9	0.05	0.0039 U
Ethylbenzene	MG/KG	100-41-4	6 - 47	0.0003 - 0.37	0.0037 - 1.9	0.04	0.0039 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Isopropyl ether	MG/KG	108-20-3	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Isopropylbenzene	MG/KG	98-82-8	4 - 47	0.0012 - 0.2	0.0037 - 1.9	0.04	0.0039 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Methylene chloride	MG/KG	75-09-2	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Naphthalene	MG/KG	91-20-3	6 - 47	0.0009 - 0.18	0.0180 - 9.3	0.18	0.019 U
n-Butylbenzene	MG/KG	104-51-8	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Propylbenzene	MG/KG	103-65-1	3 - 47	0.0005 - 0.007	0.0037 - 1.9	0.05	0.0039 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Styrene	MG/KG	100-42-5	0 - 47	- - -	0.0037 - 1.9		0.0039 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Tetrachloroethene	MG/KG	127-18-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 47	- - -	0.0370 - 19		0.039 U
Toluene	MG/KG	108-88-3	8 - 47	0.0003 - 0.0042	0.0037 - 1.9	0.05	0.0039 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 47	- - -	0.0037 - 1.9		0.0039 U
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Trichloroethene	MG/KG	79-01-6	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Vinyl chloride	MG/KG	75-01-4	0 - 47	- - -	0.0037 - 1.9		0.0039 U
Xylene, o	MG/KG	95-47-6	2 - 47	0.0008 - 0.0016	0.0037 - 1.9	0.05	0.0039 U
Xylenes (m&p)	MG/KG	179601-23-1	6 - 47	0.0008 - 0.0011	0.0037 - 1.9	0.05	0.0039 U
Xylenes, Total	MG/KG	1330-20-7	6 - 47	0.0008 - 0.0026	0.0037 - 1.9	0.05	0.0039 U
Hydrazine/aldehydes							
Formaldehyde	MG/KG	50-00-0	20 - 47	1.3 - 11	2.1 - 2.6	1.81	1.5 J
Hydrazine	MG/KG	302-01-2	21 - 47	0.0013 - 0.019	0.01 - 0.007		0.0017 J
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 47	- - -	0.01 - 0.007		0.0055 U
UDMH	MG/KG	57-14-7	0 - 47	- - -	0.01 - 0.007		0.0055 U

MG/KG = milligrams per kilogram
J - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-701 OC-SB-701-0_0/2_0-XXX 11/11/2019 0- 2	SB-701 OC-SB-701-2_0/4_0-XXX 11/11/2019 2- 4	SB-701 OC-SB-701-4_0/6_0-XXX 11/11/2019 4- 6	SB-701 OC-SB-701-6_0/8_0-XXX 11/11/2019 6- 8	SB-701 OC-SB-701-8_0/10-XXX 11/11/2019 8- 10	SB-702 OC-SB-702-0_0/2_0-XXX 11/8/2019 0- 2	SB-702 OC-SB-702-2_0/4_0-XXX 11/8/2019 2- 4	SB-702 OC-SB-702-4_0/6_0-XXX 11/8/2019 4- 6	SB-702 OC-SB-702-6_0/8_0-XXX 11/8/2019 6- 8	SB-702 OC-SB-702-8_0/10-XXX 11/8/2019 8- 10
Dimethylformamide																
Dimethylformamide	MG/KG	68-12-2	0 - 63	-	0.14 - 0.84		0.18 U	0.2 U	0.22 U	0.15 U	0.16 U	0.16 U	0.16 U	0.17 U	0.15 U	0.14 U
Inorganics																
Sulfate	MG/KG	14808-79-8	58 - 58	12 - 18000	- - -	2914	12000 J	15000 J	230 J	130 J	250 J	610 J	3000 J	6100 J	730 J	180
Chloride	MG/KG	16887-00-6	18 - 58	4.1 - 19	10 - 13	6.39	12 UJ	11 UJ	12 UJ	11 UJ	12 UJ	9.3 J	10 UJ	11 UJ	11 UJ	10 U
Ammonia	MG/KG	7664-41-7	55 - 58	3.5 - 58	6.6 - 9.9	15.25	4.7	28	35	21	27	4 J	6	6	7.8	13
Sulfate	MG/KG	14808-79-8	10 - 10	57 - 13000	- -	3460										
Chloride	MG/KG	16887-00-6	1 - 10	44 - 44	15 - 25	13.35										
Total Organic Carbon	MG/KG	HLA0011	1 - 1	9400 - 9400	- - -	9400										
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37										
Metals & Inorganics																
Chromium, Hexavalent	MG/KG	18540-29-9	54 - 58	0.18 - 20.8	0.44 - 0.49	2.59	2.8	3.7	0.66	0.73	0.98	1.6	0.98	0.71	0.55	0.44 U
Aluminum	MG/KG	7429-90-5	68 - 68	2100 - 15000	- - -	7328	9900	7400	4700	4000	3400	9200	9000	11000	10000	6300
Iron	MG/KG	7439-89-6	68 - 68	2700 - 23000	- - -	9543	10000	8800	3200	3700	4700	13000	9800	13000	13000	15000
Lead	MG/KG	7439-92-1	68 - 68	1.7 - 22	- - -	6.92	11	7.8	2.5	1.9	1.9	12	22	7.4	14	9.3
Magnesium	MG/KG	7439-95-4	68 - 68	820 - 7300	- - -	2642	3700 J+	2400	1000	1200	1200	4000	2600	3900	4500	3600
Manganese	MG/KG	7439-96-5	68 - 68	31 - 370	- - -	128.24	180 J	120	50	41	45	270	130	200	200	250
Mercury	MG/KG	7439-97-6	30 - 68	0.0086 - 0.19	0.019 - 0.21	0.04	0.031 J	0.069	0.024 U	0.023 U	0.024 U	0.041	0.11	0.011 J	0.02 J	0.022 U
Nickel	MG/KG	7440-02-0	68 - 68	2.5 - 40	- - -	11.55	11	11	4.1 J	5.2 J	6.3	8.2	10	23	23	31
Silver	MG/KG	7440-22-4	10 - 68	0.13 - 1.2	0.61 - 0.82	0.39	0.72 U	0.66 U	0.73 U	0.67 U	0.75 U	0.69 U	0.64 U	0.66 U	0.65 U	0.68 U
Sodium	MG/KG	7440-23-5	60 - 68	46 - 470	150 - 180	144.91	150 J	160	97 J	75 J	73 J	220	130 J	160	130 J	110 J
Thallium	MG/KG	7440-28-0	0 - 68	-	1.1 - 8.2		7.2 U	6.6 U	7.3 U	6.7 U	7.5 U	6.9 U	6.4 U	6.6 U	6.5 U	6.8 U
Tin	MG/KG	7440-31-5	46 - 68	0.5 - 36	2.1 - 2.7	4.07	0.72 J	1.1 J	2.4 U	2.2 U	2.5 U	0.91 J	0.69 J	0.82 J	1.2 J	0.62 J
Antimony	MG/KG	7440-36-0	17 - 68	0.45 - 1.2	0.57 - 83	5.97	0.63 J-	17 U	18 U	17 U	19 U	17 U	16 U	17 U	16 U	0.55 J
Arsenic	MG/KG	7440-38-2	68 - 68	0.76 - 33	- - -	8.47	8.6	7.3	0.76 J	1.9 J	3.5	5.1	7.6	9.7	11	26
Barium	MG/KG	7440-39-3	68 - 68	6.6 - 89	- - -	33.80	71 J+	46	7	7.5	9.9	46	33	41	41	29
Beryllium	MG/KG	7440-41-7	68 - 68	0.08 - 0.67	- - -	0.32	0.46 J	0.33	0.16 J	0.18 J	0.16 J	0.5	0.44	0.65	0.55	0.28
Cadmium	MG/KG	7440-43-9	44 - 68	0.035 - 9.3	0.21 - 0.26	0.40	0.37	0.17 J	0.24 U	0.22 U	0.25 U	0.036 J	0.21 U	0.22 U	0.22 U	0.23 U
Chromium	MG/KG	7440-47-3	68 - 68	5.3 - 1300	- - -	97.51	72 J+	200	8.1	14	12	32	20	34	42	22
Cobalt	MG/KG	7440-48-4	68 - 68	0.79 - 13	- - -	4.03	3.9	3.5	1.1	1.4	3	5.6	4.1	6.5	6	7
Copper	MG/KG	7440-50-8	68 - 68	0.75 - 27	- - -	8.89	10	8.2	0.75 J	1.6	2.9	8.2	9.3	9.4	12	9.5
Vanadium	MG/KG	7440-62-2	68 - 68	5.2 - 40	- - -	15.83	19 J+	16	6.1	6	6.6	25	18	23	22	16
Zinc	MG/KG	7440-66-6	68 - 68	6.4 - 78	- - -	22.89	26 J+	27	7	8.4	10	30	28	28	33	26
Calcium	MG/KG	7440-70-2	68 - 68	550 - 110000	- - -	10629	28000	44000	2100	1100	1100	14000	3800	2800	2300	1400
Selenium	MG/KG	7782-49-2	10 - 68	0.5 - 1.1	0.57 - 5.5	1.78	4.8 U	4.4 U	4.9 U	4.4 U	5 U	4.6 U	4.3 U	0.61 J	4.4 U	4.6 U
Potassium	MG/KG	9/7/7440	68 - 68	340 - 4300	- - -	1220	1200 J+	920	340	400	530	1300	1400	1800	1800	1500
Phthalates																
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	-	0.11 - 0.12											
Semi-Volatile Organic Compounds																
4-Nitroaniline	MG/KG	100-01-6	0 - 68	-	0.18 - 5.4		0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U	0.18 U
4-Nitrophenol	MG/KG	100-02-7	0 - 68	-	0.18 - 5.4		0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U	0.18 U
Benzyl alcohol	MG/KG	100-51-6	1 - 68	0.059 - 0.059	0.034 - 1.1	0.044	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Benzaldehyde	MG/KG	100-52-7	7 - 68	0.0067 - 0.23	0.036 - 2.1	0.080	0.082 UJ	0.077 U	0.079 U	0.078 U	0.081 U	0.077 R	0.071 R	0.075 R	0.15 R	0.071 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 68	0.19 - 0.19	0.034 - 1.1	0.041	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.044	0.019										
Azobenzene	MG/KG	103-33-3	0 - 68	-	0.036 - 7.5		0.4 U	1.9 U	0.4 U	0.38 U	0.39 U	0.38 U	0.35 U	0.37 U	0.36 U	0.35 U
Caprolactam	MG/KG	105-60-2	0 - 68	-	0.036 - 5.4		0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U	0.18 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 68	0.0039 - 0.012	0.034 - 1.1	0.040	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
4-Chloroaniline	MG/KG	106-47-8	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 68	-	0.007 - 0.21		0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
Phenol	MG/KG	108-95-2	13 - 68	0.011 - 8.8	0.034 - 1.1	0.182	0.04 U	0.023 J	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 68	-	0.007 - 0.21		0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	54 - 68	0.043 - 420	0.34 - 0.41	13.127	0.64	3.9	0.15 J	0.38 U	0.4 U	0.23 J	0.27 J	3.5	0.8	0.63
Di-n-octylphthalate	MG/KG	117-84-0	2 - 68	0.023 - 0.061	0.034 - 1.1	0.041	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 68	-	0.007 - 0.21		0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
Diphenylmethanone	MG/KG	119-61-9	0 - 10	-	0.036 - 0.044											
Anthracene	MG/KG	120-12-7	13 - 68	0.0021 - 0.06	0.007 - 0.21	0.010	0.0082 U	0.0077 U	0.0021 J	0.0078 U	0.0081 U	0.0077 U	0.0022 J	0.0075 U	0.015	0.0071 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	12 - 68	0.0017 - 0.068	0.034 - 1.1	0.037	0.04 U	0.0074 J	0.0019 J	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 68	-	0.007 - 0.21		0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-701 OC-SB-701-0_0/2_0-XXX 11/11/2019 0- 2	SB-701 OC-SB-701-2_0/4_0-XXX 11/11/2019 2- 4	SB-701 OC-SB-701-4_0/6_0-XXX 11/11/2019 4- 6	SB-701 OC-SB-701-6_0/8_0-XXX 11/11/2019 6- 8	SB-701 OC-SB-701-8_0/10-XXX 11/11/2019 8- 10	SB-702 OC-SB-702-0_0/2_0-XXX 11/8/2019 0- 2	SB-702 OC-SB-702-2_0/4_0-XXX 11/8/2019 2- 4	SB-702 OC-SB-702-4_0/6_0-XXX 11/8/2019 4- 6	SB-702 OC-SB-702-6_0/8_0-XXX 11/8/2019 6- 8	SB-702 OC-SB-702-8_0/10-XXX 11/8/2019 8- 10
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.039	0.018										
Pyrene	MG/KG	129-00-0	38 - 68	0.0017 - 0.15	0.007 - 0.21	0.018	0.0082 U	0.0086	0.0076 J	0.0078 U	0.0081 U	0.013	0.014	0.0064 J	0.087	0.003 J
Dimethylphthalate	MG/KG	131-11-3	1 - 68	0.002 - 0.002	0.034 - 1.1	0.040	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.002 J	0.075 U	0.035 U
Dibenzofuran	MG/KG	132-64-9	3 - 68	0.0088 - 0.029	0.034 - 1.1	0.037	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	-	0.036 - 0.044											
Atrazine	MG/KG	1912-24-9	0 - 68	-	0.036 - 2.1		0.082 U	0.077 U	0.079 U	0.078 U	0.081 U	0.077 U	0.071 U	0.075 U	0.15 U	0.071 U
Benzo(ghi)perylene	MG/KG	191-24-2	22 - 68	0.0018 - 0.056	0.007 - 0.21	0.012	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0085	0.01	0.0032 J	0.029	0.0071 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	21 - 68	0.0017 - 0.038	0.007 - 0.21	0.012	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0073 J	0.0087	0.0028 J	0.025	0.0071 U
Benzo(b)fluoranthene	MG/KG	205-99-2	29 - 68	0.0021 - 0.068	0.007 - 0.21	0.014	0.0082 U	0.0077 U	0.0032 J	0.0078 U	0.0081 U	0.011	0.017	0.0053 J	0.043	0.0071 U
Fluoranthene	MG/KG	206-44-0	40 - 68	0.0028 - 0.16	0.007 - 0.21	0.018	0.0035 J	0.0082	0.0063 J	0.0078 U	0.0081 U	0.014	0.015	0.0059 J	0.081	0.003 J
Benzo(k)fluoranthene	MG/KG	207-08-9	15 - 68	0.003 - 0.032	0.007 - 0.21	0.011	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0053 J	0.0059 J	0.0075 U	0.02	0.0071 U
Acenaphthylene	MG/KG	208-96-8	7 - 68	0.0016 - 0.0063	0.007 - 0.21	0.010	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0017 J	0.0075 U	0.0033 J	0.0071 U
Chrysene	MG/KG	218-01-9	31 - 68	0.0021 - 0.075	0.007 - 0.21	0.014	0.0082 U	0.0077 U	0.0046 J	0.0078 U	0.0081 U	0.01	0.014	0.0045 J	0.046	0.0071 U
Benzo(a)pyrene	MG/KG	50-32-8	23 - 68	0.0026 - 0.067	0.007 - 0.21	0.013	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0097	0.01	0.0037 J	0.045	0.0071 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 68	-	0.036 - 11		0.4 U	0.38 U	0.39 U	0.38 U	0.4 U	0.38 U	0.35 U	0.37 U	0.75 U	0.35 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 68	-	0.18 - 5.4		0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U	0.18 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	9 - 68	0.0021 - 0.012	0.007 - 0.21	0.010	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0034 J	0.0027 J	0.0075 U	0.0096 J	0.0071 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Benzo(a)anthracene	MG/KG	56-55-3	31 - 68	0.0014 - 0.072	0.007 - 0.21	0.013	0.0082 U	0.0077 U	0.0042 J	0.0078 U	0.0081 U	0.0088	0.011	0.0039 J	0.049	0.0071 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 68	-	0.007 - 0.21		0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
Aniline	MG/KG	62-53-3	1 - 68	0.017 - 0.017	0.034 - 1.1	0.041	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 68	-	0.006 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Benzoic Acid	MG/KG	65-85-0	0 - 68	-	0.18 - 5.4		0.21 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U	0.18 U
Hexachloroethane	MG/KG	67-72-1	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	2 - 68	0.0064 - 0.031	0.034 - 1.1	0.040	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 68	-	0.034 - 1.1		0.04 UJ	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Isophorone	MG/KG	78-59-1	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Acenaphthene	MG/KG	83-32-9	3 - 68	0.0055 - 0.017	0.007 - 0.21	0.011	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.0055 J	0.0071 U
Diethylphthalate	MG/KG	84-66-2	2 - 68	0.02 - 0.025	0.034 - 1.1	0.041	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Di-n-butylphthalate	MG/KG	84-74-2	5 - 68	0.018 - 2.1	0.034 - 1.1	0.069	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Phenanthrene	MG/KG	85-01-8	43 - 68	0.0022 - 0.66	0.007 - 0.21	0.025	0.0024 J	0.0065 J	0.0056 J	0.0028 J	0.0081 U	0.0064 J	0.0094	0.0045 J	0.048	0.0071 U
Phthalic anhydride	MG/KG	85-44-9	0 - 58	-	10 - 230		12 UJ	56 UJ	12 UJ	11 UJ	12 UJ	11 UJ	10 UJ	11 UJ	11 UJ	11 UJ
Butylbenzylphthalate	MG/KG	85-68-7	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	38 - 69	0.012 - 54	0.034 - 0.2	1.366	0.093	0.43	1.5	0.038 U	0.04 U	0.013 J	0.035 U	0.012 J	0.075 U	0.035 U
Fluorene	MG/KG	86-73-7	7 - 68	0.0019 - 0.022	0.007 - 0.21	0.011	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.0053 J	0.0071 U
Carbazole	MG/KG	86-74-8	10 - 68	0.0017 - 0.055	0.007 - 0.21	0.010	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0018 J	0.0075 U	0.0037 J	0.0071 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.007 - 0.21		0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
Pentachlorophenol	MG/KG	87-86-5	0 - 68	-	0.036 - 5.4		0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U	0.18 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
2-Nitroaniline	MG/KG	88-74-4	0 - 68	-	0.18 - 5.4		0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U	0.18 U
2-Nitrophenol	MG/KG	88-75-5	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
1-Methylnaphthalene	MG/KG	90-12-0	6 - 68	0.002 - 0.06	0.007 - 0.072	0.009	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
Naphthalene	MG/KG	91-20-3	24 - 68	0.0014 - 0.54	0.007 - 0.21	0.022	0.0025 J	0.034	0.54	0.0078 U	0.0081 U	0.0077 U	0.0014 J	0.0075 U	0.015 U	0.0022 J
2-Methylnaphthalene	MG/KG	91-57-6	7 - 68	0.0019 - 0.1	0.007 - 0.19	0.011	0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 68	-	0.007 - 0.21		0.0082 U	0.0077 U	0.0079 U	0.0078 U	0.0081 U	0.0077 U	0.0071 U	0.0075 U	0.015 U	0.0071 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Biphenyl	MG/KG	92-52-4	21 - 68	0.0017 - 14	0.034 - 1.1	0.312	0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.002 J	0.037 U	0.075 U	0.035 U
2-Methylphenol	MG/KG	95-48-7	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
2-Chlorophenol	MG/KG	95-57-8	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 68	-	0.034 - 1.1		0.04 U	0.038 U	0.039 U	0.038 U	0.04 U	0.038 U	0.035 U	0.037 U	0.075 U	0.035 U
Acetophenone	MG/KG	98-86-2	6 - 68	0.0034 - 0.0083	0.036 - 2.1	0.075	0.082 U	0.077 U	0.079 U	0.078 U	0.081 U	0.077 U	0.071 U	0.075 U	0.15 U	0.071 U
Nitrobenzene	MG/KG	98-95-3	0 - 68	-	0.036 - 2.1		0.082 U	0.077 U	0.079 U	0.077 U	0.08 U	0.077 U	0.07 U	0.075 U	0.15 U	0.071 U
3-Nitroaniline	MG/KG	99-09-2	0 - 68	-	0.18 - 5.4		0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.18 U	0.19 U	0.39 U	0.18 U
Volatile Organic Compounds																
Ethylbenzene	MG/KG	100-41-4	7 - 68	0.00027 - 0.37	0.002 - 1.9	0.030	0.0043 U	0.00049 J	0.0014 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Styrene	MG/KG	100-42-5	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-701 OC-SB-701-0_0/2_0-XXX 11/11/2019 0- 2	SB-701 OC-SB-701-2_0/4_0-XXX 11/11/2019 2- 4	SB-701 OC-SB-701-4_0/6_0-XXX 11/11/2019 4- 6	SB-701 OC-SB-701-6_0/8_0-XXX 11/11/2019 6- 8	SB-701 OC-SB-701-8_0/10-XXX 11/11/2019 8- 10	SB-702 OC-SB-702-0_0/2_0-XXX 11/8/2019 0- 2	SB-702 OC-SB-702-2_0/4_0-XXX 11/8/2019 2- 4	SB-702 OC-SB-702-4_0/6_0-XXX 11/8/2019 4- 6	SB-702 OC-SB-702-6_0/8_0-XXX 11/8/2019 6- 8	SB-702 OC-SB-702-8_0/10-XXX 11/8/2019 8- 10
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Propylbenzene	MG/KG	103-65-1	3 - 68	0.00049 - 0.007	0.002 - 1.9	0.032	0.0043 U	0.0012 J	0.007	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
n-Butylbenzene	MG/KG	104-51-8	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	36 - 68	0.00076 - 8	0.004 - 1.2	0.179	0.0043 UJ	0.059	0.067	0.00076 J	0.0052 U	0.0047 U	0.0024 J	0.0012 J	0.013	0.016
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	27 - 68	0.00056 - 6.3	0.004 - 1.2	0.143	0.0043 UJ	0.024	0.034	0.0043 U	0.0052 U	0.0047 U	0.00084 J	0.0049 U	0.0044	0.0031 J
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 68	-	0.018 - 9.3		0.022 U	0.023 U	0.026 U	0.021 U	0.026 U	0.023 U	0.021 U	0.025 U	0.021 U	0.023 U
Isopropyl ether	MG/KG	108-20-3	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	6 - 68	0.00037 - 0.0014	0.002 - 1.9	0.032	0.0043 U	0.00082 J	0.00079 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Bromobenzene	MG/KG	108-86-1	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Toluene	MG/KG	108-88-3	10 - 68	0.00029 - 0.0042	0.002 - 1.9	0.032	0.0043 U	0.00043 J	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Chlorobenzene	MG/KG	108-90-7	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 68	-	0.023 - 19		0.043 UJ	0.046 U	0.052 U	0.043 U	0.052 U	0.047 U	0.041 U	0.049 U	0.042 U	0.046 U
Cyclohexane	MG/KG	110-82-7	0 - 68	-	0.018 - 9.3		0.022 U	0.023 U	0.026 U	0.021 U	0.026 U	0.023 U	0.021 U	0.025 U	0.021 U	0.023 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	10 - 68	0.00036 - 0.0025	0.002 - 1.9	0.032	0.0043 UJ	0.0019 J	0.00054 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,4-Dioxane	MG/KG	123-91-1	0 - 68	-	0.18 - 93		0.22 UJ	0.23 U	0.26 U	0.21 U	0.26 U	0.23 U	0.21 U	0.25 U	0.21 U	0.23 U
Dibromochloromethane	MG/KG	124-48-1	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Tetrachloroethene	MG/KG	127-18-4	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Xylenes, Total	MG/KG	1330-20-7	7 - 68	0.00075 - 0.0026	0.004 - 1.9	0.032	0.0043 U	0.0046 U	0.0026 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Xylenes (m&p)	MG/KG	179601-23-1	7 - 68	0.00075 - 0.0014	0.004 - 1.9	0.032	0.0043 U	0.0046 U	0.00098 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 68	0.00032 - 0.0004	0.002 - 1.9	0.032	0.0043 U	0.00032 J	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
2-Hexanone	MG/KG	591-78-6	0 - 68	-	0.018 - 9.3		0.022 UJ	0.023 U	0.026 U	0.021 U	0.026 U	0.023 U	0.021 U	0.025 U	0.021 U	0.023 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Diethyl ether	MG/KG	60-29-7	2 - 68	0.0028 - 0.0034	0.002 - 1.9	0.032	0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Acetone	MG/KG	67-64-1	38 - 68	0.0042 - 0.099	0.19 - 93	1.580	0.014 J-	0.082 J	0.099 J	0.016 J	0.012 J	0.023 J	0.054 J	0.054 J	0.02 J	0.0056 J
Chloroform	MG/KG	67-66-3	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Benzene	MG/KG	71-43-2	5 - 68	0.0002 - 0.0008	0.002 - 1.9	0.032	0.0043 U	0.0046 U	0.00082 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.00037 J	0.0046 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Bromomethane	MG/KG	74-83-9	0 - 68	-	0.004 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Chloromethane	MG/KG	74-87-3	0 - 68	-	0.004 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Dibromomethane	MG/KG	74-95-3	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Bromochloromethane	MG/KG	74-97-5	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Chloroethane	MG/KG	75-00-3	0 - 68	-	0.004 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Vinyl chloride	MG/KG	75-01-4	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Methylene chloride	MG/KG	75-09-2	0 - 68	-	0.004 - 1.9		0.019 U	0.026 U	0.017 U	0.025 U	0.026 U	0.0065 U	0.0056 U	0.0084 U	0.0045 U	0.02 U
Carbon disulfide	MG/KG	75-15-0	10 - 68	0.0024 - 0.0066	0.002 - 1.9	0.032	0.0043 U	0.0042 J	0.0066	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Bromoform	MG/KG	75-25-2	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Bromodichloromethane	MG/KG	75-27-4	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,1-Dichloroethane	MG/KG	75-34-3	2 - 68	0.0007 - 0.0008	0.002 - 1.9	0.032	0.0043 U	0.0046 U	0.0007 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 68	-	0.004 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 68	-	0.004 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 68	-	0.004 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
2-Butanone	MG/KG	78-93-3	26 - 68	0.0044 - 0.56	0.018 - 9.3	0.173	0.022 U	0.021 J+	0.023 J+	0.021 U	0.026 U	0.023 U	0.014 J+	0.029 J+	0.0044 J+	0.023 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Trichloroethene	MG/KG	79-01-6	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 68	0.0063 - 0.33	0.037 - 19	0.255	0.043 UJ	0.046 U	0.052 U	0.043 U	0.052 U	0.047 U	0.041 U	0.0081 J	0.042 U	0.0063 J
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-701 OC-SB-701-0_0/2_0-XXX 11/11/2019 0- 2	SB-701 OC-SB-701-2_0/4_0-XXX 11/11/2019 2- 4	SB-701 OC-SB-701-4_0/6_0-XXX 11/11/2019 4- 6	SB-701 OC-SB-701-6_0/8_0-XXX 11/11/2019 6- 8	SB-701 OC-SB-701-8_0/10-XXX 11/11/2019 8- 10	SB-702 OC-SB-702-0_0/2_0-XXX 11/8/2019 0- 2	SB-702 OC-SB-702-2_0/4_0-XXX 11/8/2019 2- 4	SB-702 OC-SB-702-4_0/6_0-XXX 11/8/2019 4- 6	SB-702 OC-SB-702-6_0/8_0-XXX 11/8/2019 6- 8	SB-702 OC-SB-702-8_0/10-XXX 11/8/2019 8- 10
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Naphthalene	MG/KG	91-20-3	8 - 68	0.0009 - 0.18	0.018 - 9.3	0.128	0.022 UJ	0.003 J	0.18	0.015 J	0.026 U	0.023 U	0.021 U	0.025 U	0.021 U	0.023 U
Xylene, o	MG/KG	95-47-6	2 - 68	0.00075 - 0.0016	0.002 - 1.9	0.032	0.0043 U	0.00075 J	0.0016 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	4 - 68	0.0027 - 0.016	0.002 - 1.9	0.032	0.0043 U	0.0038 J	0.016	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 68	-	0.018 - 9.3		0.022 UJ	0.023 U	0.026 U	0.021 U	0.026 U	0.023 U	0.021 U	0.025 U	0.021 U	0.023 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 68	-	0.002 - 1.9		0.0043 UJ	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Isopropylbenzene	MG/KG	98-82-8	4 - 68	0.0012 - 0.2	0.002 - 1.9	0.028	0.0043 U	0.0012 J	0.0037 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 68	-	0.002 - 1.9		0.0043 U	0.0046 U	0.0052 U	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
4-iso-Propyltoluene	MG/KG	99-87-6	8 - 68	0.00041 - 0.42	0.002 - 1.9	0.031	0.0043 UJ	0.00041 J	0.00048 J	0.0043 U	0.0052 U	0.0047 U	0.0041 U	0.0049 U	0.0042 U	0.0046 U
Hydrazine/aldehydes																
Hydrazine	MG/KG	302-01-2	31 - 63	0.00062 - 0.086	0.002 - 0.007	0.005	0.0053 J	0.011	0.0028 J	0.0017 J	0.0022 J	0.0058 U	0.0015 J	0.0054 U	0.0055 U	0.0021 J
Formaldehyde	MG/KG	50-00-0	26 - 63	0.096 - 11	0.11 - 2.6	1.612	2.5 UJ	1.6 J	1.5 J	2.3 UJ	2.4 UJ	2.3 U	1.5 J	2.2 UJ	2.2 UJ	2.2 UJ
UDMH	MG/KG	57-14-7	0 - 63	-	0.005 - 0.007		0.0061 U	0.006 U	0.006 U	0.0059 U	0.0062 U	0.0058 U	0.0053 U	0.0054 U	0.0055 U	0.0054 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 63	-	0.005 - 0.007		0.0061 U	0.006 U	0.006 U	0.0059 U	0.0062 U	0.0058 U	0.0053 U	0.0054 U	0.0055 U	0.0054 U
Acetaldehyde	MG/KG	75-07-0	0 - 5	-	0.23 - 0.24											

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-703 OC-SB-703-0_0/2_0-XXX 11/5/2019 0- 2	SB-703 OC-SB-703-2_0/4_0-XXX 11/5/2019 2- 4	SB-703 OC-SB-703-4_0/6_0-XXX 11/5/2019 4- 6	SB-703 OC-SB-703-6_0/8_0-XXX 11/5/2019 6- 8	SB-703 OC-SB-703-8_0/10-XXX 11/5/2019 8- 10	SB-704 OC-SB-704-0_0/2_0-XXX 11/7/2019 0- 2	SB-704 OC-SB-704-2_0/4_0-XXX 11/7/2019 2- 4	SB-704 OC-SB-704-4_0/6_0-XXX 11/7/2019 4- 6	SB-704 OC-SB-704-6_0/8_0-XXX 11/7/2019 6- 8	SB-704 OC-SB-704-8_0/10-XXX 11/7/2019 8- 10
Dimethylformamide																
Dimethylformamide	MG/KG	68-12-2	0 - 63	-	0.14 - 0.84		0.18 U	0.2 U	0.2 U	0.2 U	0.2 U	0.26 U	0.18 U	0.18 U	0.15 U	0.18 U
Inorganics																
Sulfate	MG/KG	14808-79-8	58 - 58	12 - 18000	- - -	2914	18000	10000	430	180	160	18000 J	16000 J	760 J	530 J	150 J
Chloride	MG/KG	16887-00-6	18 - 58	4.1 - 19	10 - 13	6.39	5.4 J	12 U	12 U	5.8 J	9.2 J	4.7 J	11 UJ	11 UJ	11 UJ	4.8 J
Ammonia	MG/KG	7664-41-7	55 - 58	3.5 - 58	6.6 - 9.9	15.25	7	12	7.9	10	10	15	44	40	46	41
Sulfate	MG/KG	14808-79-8	10 - 10	57 - 13000	- -	3460										
Chloride	MG/KG	16887-00-6	1 - 10	44 - 44	15 - 25	13.35										
Total Organic Carbon	MG/KG	HLA0011	1 - 1	9400 - 9400	- - -	9400										
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37										
Metals & Inorganics																
Chromium, Hexavalent	MG/KG	18540-29-9	54 - 58	0.18 - 20.8	0.44 - 0.49	2.59	5.8	0.7 J	0.29 J	0.37 J	3.2	4.1	0.49 U	0.46 U	2.4	5.3
Aluminum	MG/KG	7429-90-5	68 - 68	2100 - 15000	- - -	7328	9000	6500 J+	4700	4600	6100	7700	5600	4800	15000	9200
Iron	MG/KG	7439-89-6	68 - 68	2700 - 23000	- - -	9543	9200	5000 J+	5200	7900	7600	10000	3800	6200	20000	13000
Lead	MG/KG	7439-92-1	68 - 68	1.7 - 22	- - -	6.92	9.7	3.6	2.3	2.6	3.6	8.3	3.1	2.7	5.9	5.2
Magnesium	MG/KG	7439-95-4	68 - 68	820 - 7300	- - -	2642	2500	1100 J+	1100	1800	1800	2300	820	1700	5200	3100
Manganese	MG/KG	7439-96-5	68 - 68	31 - 370	- - -	128.24	110	63 J+	61	89	73	93	31	68	210	130
Mercury	MG/KG	7439-97-6	30 - 68	0.0086 - 0.19	0.019 - 0.21	0.04	0.037	0.032	0.024 U	0.025 U	0.022 U	0.035	0.023 U	0.022 U	0.021 U	0.02 U
Nickel	MG/KG	7440-02-0	68 - 68	2.5 - 40	- - -	11.55	8.9	7	4.6 J	7.3	7.5	8.6	4.7 J	7.8	18	11
Silver	MG/KG	7440-22-4	10 - 68	0.13 - 1.2	0.61 - 0.82	0.39	0.8 U	0.73 U	0.77 U	0.74 U	0.65 U	0.75 U	0.71 U	0.66 U	0.64 U	0.64 U
Sodium	MG/KG	7440-23-5	60 - 68	46 - 470	150 - 180	144.91	160 J	170 U	180 U	170 U	150 U	190	80 J	130 J	280	240
Thallium	MG/KG	7440-28-0	0 - 68	-	1.1 - 8.2		8 U	7.3 U	7.7 U	7.4 U	6.5 U	7.5 U	7.1 U	6.6 U	6.4 U	6.4 U
Tin	MG/KG	7440-31-5	46 - 68	0.5 - 36	2.1 - 2.7	4.07	1.1 J	2.4 U	2.6 U	2.5 U	2.2 U	0.97 J	0.51 J	2.2 U	0.92 J	0.59 J
Antimony	MG/KG	7440-36-0	17 - 68	0.45 - 1.2	0.57 - 83	5.97	20 U	18 U	19 U	18 U	16 U	19 U	18 U	16 U	16 U	16 U
Arsenic	MG/KG	7440-38-2	68 - 68	0.76 - 33	- - -	8.47	13	4.1	3.4	7.5	4.2	17	5.4	4.8	11	7.8
Barium	MG/KG	7440-39-3	68 - 68	6.6 - 89	- - -	33.80	89 J	12 J-	11 J	10 J	15 J	61	11	12	79	37
Beryllium	MG/KG	7440-41-7	68 - 68	0.08 - 0.67	- - -	0.32	0.39	0.21 J	0.19 J	0.22 J	0.3	0.38	0.27	0.17 J	0.67 J	0.5 J
Cadmium	MG/KG	7440-43-9	44 - 68	0.035 - 9.3	0.21 - 0.26	0.40	0.3 J	0.06 J	0.26 U	0.25 U	0.22 U	0.45	0.058 J	0.22 U	0.21 U	0.21 U
Chromium	MG/KG	7440-47-3	68 - 68	5.3 - 1300	- - -	97.51	180	14 J+	6.8	9.9	52	140	8.6	13	63	97
Cobalt	MG/KG	7440-48-4	68 - 68	0.79 - 13	- - -	4.03	3.5	2.2	2.4	2.4	2.8	3.7	2.2	2.3	6.1	4.4
Copper	MG/KG	7440-50-8	68 - 68	0.75 - 27	- - -	8.89	9.2	2.9 J	2.1	2.9	7.3	8.5	0.84 J	3.9	14	11
Vanadium	MG/KG	7440-62-2	68 - 68	5.2 - 40	- - -	15.83	16	8.4	7.8	8.9	12	18	7.5	9.4	34	21
Zinc	MG/KG	7440-66-6	68 - 68	6.4 - 78	- - -	22.89	22	24	10	11	17	22	10	13	42	27
Calcium	MG/KG	7440-70-2	68 - 68	550 - 110000	- - -	10629	92000	5900 J+	3800	2000	1200	110000	3700	2200	2100	1800
Selenium	MG/KG	7782-49-2	10 - 68	0.5 - 1.1	0.57 - 5.5	1.78	5.3 U	4.9 U	5.2 U	4.9 U	4.3 U	5 U	4.7 U	4.4 U	4.3 U	4.2 U
Potassium	MG/KG	9/7/7440	68 - 68	340 - 4300	- - -	1220	980	550	430	580	670	770	410	640	4300	1700
Phthalates																
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	-	0.11 - 0.12											
Semi-Volatile Organic Compounds																
4-Nitroaniline	MG/KG	100-01-6	0 - 68	-	0.18 - 5.4		0.22 U	0.2 U	0.21 U	0.21 U	0.18 U	0.43 U	0.19 U	0.19 U	0.18 U	0.19 U
4-Nitrophenol	MG/KG	100-02-7	0 - 68	-	0.18 - 5.4		0.22 U	0.2 U	0.21 U	0.21 U	0.18 U	0.43 UJ	0.19 U	0.19 U	0.18 U	0.19 U
Benzyl alcohol	MG/KG	100-51-6	1 - 68	0.059 - 0.059	0.034 - 1.1	0.044	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Benzaldehyde	MG/KG	100-52-7	7 - 68	0.0067 - 0.23	0.036 - 2.1	0.080	0.01 J	0.079 R	0.082 U	0.084 U	0.073 R	0.17 R	0.01 J-	0.073 R	0.072 R	0.074 R
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 68	0.19 - 0.19	0.034 - 1.1	0.041	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.044	0.019										
Azobenzene	MG/KG	103-33-3	0 - 68	-	0.036 - 7.5		0.43 U	0.4 U	0.41 U	0.41 U	0.36 U	0.41 U	0.37 U	0.37 U	0.36 U	0.34 U
Caprolactam	MG/KG	105-60-2	0 - 68	-	0.036 - 5.4		0.22 U	0.2 U	0.21 U	0.21 U	0.18 U	0.43 U	0.19 U	0.19 U	0.18 U	0.19 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 68	0.0039 - 0.012	0.034 - 1.1	0.040	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
4-Chloroaniline	MG/KG	106-47-8	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 68	-	0.007 - 0.21		0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Phenol	MG/KG	108-95-2	13 - 68	0.011 - 8.8	0.034 - 1.1	0.182	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.33	0.068	0.042	0.014 J	0.036 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 68	-	0.007 - 0.21		0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 UJ	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	54 - 68	0.043 - 420	0.34 - 0.41	13.127	1.6	0.65 J	0.4 U	0.41 U	0.06 J	7.6	2.4	0.36 U	0.35 U	0.36 U
Di-n-octylphthalate	MG/KG	117-84-0	2 - 68	0.023 - 0.061	0.034 - 1.1	0.041	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 68	-	0.007 - 0.21		0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Diphenylmethanone	MG/KG	119-61-9	0 - 10	-	0.036 - 0.044											
Anthracene	MG/KG	120-12-7	13 - 68	0.0021 - 0.06	0.007 - 0.21	0.010	0.0031 J	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.0091 J	0.0076 U	0.0073 U	0.0072 U	0.0074 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	12 - 68	0.0017 - 0.068	0.034 - 1.1	0.037	0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 68	-	0.007 - 0.21		0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-703 OC-SB-703-0_0/2_0-XXX 11/5/2019 0- 2	SB-703 OC-SB-703-2_0/4_0-XXX 11/5/2019 2- 4	SB-703 OC-SB-703-4_0/6_0-XXX 11/5/2019 4- 6	SB-703 OC-SB-703-6_0/8_0-XXX 11/5/2019 6- 8	SB-703 OC-SB-703-8_0/10-XXX 11/5/2019 8- 10	SB-704 OC-SB-704-0_0/2_0-XXX 11/7/2019 0- 2	SB-704 OC-SB-704-2_0/4_0-XXX 11/7/2019 2- 4	SB-704 OC-SB-704-4_0/6_0-XXX 11/7/2019 4- 6	SB-704 OC-SB-704-6_0/8_0-XXX 11/7/2019 6- 8	SB-704 OC-SB-704-8_0/10-XXX 11/7/2019 8- 10
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.039	0.018										
Pyrene	MG/KG	129-00-0	38 - 68	0.0017 - 0.15	0.007 - 0.21	0.018	0.012	0.0056 J	0.0082 U	0.0084 U	0.0073 U	0.042	0.0063 J	0.0073 U	0.0072 U	0.0074 U
Dimethylphthalate	MG/KG	131-11-3	1 - 68	0.002 - 0.002	0.034 - 1.1	0.040	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Dibenzofuran	MG/KG	132-64-9	3 - 68	0.0088 - 0.029	0.034 - 1.1	0.037	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.0088 J	0.038 U	0.036 U	0.035 U	0.036 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	-	0.036 - 0.044											
Atrazine	MG/KG	1912-24-9	0 - 68	-	0.036 - 2.1		0.087 U	0.079 U	0.082 U	0.084 U	0.073 U	0.17 U	0.076 U	0.073 U	0.072 U	0.074 U
Benzo(ghi)perylene	MG/KG	191-24-2	22 - 68	0.0018 - 0.056	0.007 - 0.21	0.012	0.0076 J	0.0037 J	0.0082 U	0.0084 U	0.0073 U	0.0084 J	0.0018 J	0.0073 U	0.0072 U	0.0074 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	21 - 68	0.0017 - 0.038	0.007 - 0.21	0.012	0.006 J	0.003 J	0.0082 U	0.0084 U	0.0073 U	0.0081 J	0.002 J	0.0073 U	0.0072 U	0.0074 U
Benzo(b)fluoranthene	MG/KG	205-99-2	29 - 68	0.0021 - 0.068	0.007 - 0.21	0.014	0.01	0.0041 J	0.0082 U	0.0084 U	0.0073 U	0.014 J	0.0026 J	0.0073 U	0.0072 U	0.0074 U
Fluoranthene	MG/KG	206-44-0	40 - 68	0.0028 - 0.16	0.007 - 0.21	0.018	0.014	0.0063 J	0.0082 U	0.0084 U	0.0073 U	0.047	0.0069 J	0.0073 U	0.0072 U	0.0074 U
Benzo(k)fluoranthene	MG/KG	207-08-9	15 - 68	0.003 - 0.032	0.007 - 0.21	0.011	0.0031 J	0.003 J	0.0082 U	0.0084 U	0.0073 U	0.0052 J	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Acenaphthylene	MG/KG	208-96-8	7 - 68	0.0016 - 0.0063	0.007 - 0.21	0.010	0.003 J	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Chrysene	MG/KG	218-01-9	31 - 68	0.0021 - 0.075	0.007 - 0.21	0.014	0.0093	0.0046 J	0.0082 U	0.0084 U	0.0073 U	0.018	0.0037 J	0.0073 U	0.0072 U	0.0074 U
Benzo(a)pyrene	MG/KG	50-32-8	23 - 68	0.0026 - 0.067	0.007 - 0.21	0.013	0.0073 J	0.0034 J	0.0082 U	0.0084 U	0.0073 U	0.01 J	0.0076 U	0.0073 U	0.0072 U	0.0074 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 68	-	0.036 - 11		0.43 U	0.39 UJ	0.4 U	0.41 U	0.36 UJ	0.84 U	0.38 U	0.36 U	0.35 U	0.36 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 68	-	0.18 - 5.4		0.22 U	0.2 R	0.21 U	0.21 U	0.18 U	0.43 UJ	0.19 U	0.19 U	0.18 U	0.19 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	9 - 68	0.0021 - 0.012	0.007 - 0.21	0.010	0.0024 J	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Benzo(a)anthracene	MG/KG	56-55-3	31 - 68	0.0014 - 0.072	0.007 - 0.21	0.013	0.0069 J	0.0035 J	0.0082 U	0.0084 U	0.0073 U	0.013 J	0.0028 J	0.0073 U	0.0072 U	0.0074 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 UJ	0.038 U	0.036 U	0.035 U	0.036 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 68	-	0.007 - 0.21		0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Aniline	MG/KG	62-53-3	1 - 68	0.017 - 0.017	0.034 - 1.1	0.041	0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 68	-	0.006 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Benzoic Acid	MG/KG	65-85-0	0 - 68	-	0.18 - 5.4		0.22 U	0.2 R	0.21 U	0.21 U	0.18 R	0.43 R	0.19 U	0.19 U	0.18 U	0.19 U
Hexachloroethane	MG/KG	67-72-1	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	2 - 68	0.0064 - 0.031	0.034 - 1.1	0.040	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.031 J	0.0064 J	0.036 U	0.035 U	0.036 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 68	-	0.034 - 1.1		0.043 U	0.039 UJ	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Isophorone	MG/KG	78-59-1	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Acenaphthene	MG/KG	83-32-9	3 - 68	0.0055 - 0.017	0.007 - 0.21	0.011	0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.016 J	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Diethylphthalate	MG/KG	84-66-2	2 - 68	0.02 - 0.025	0.034 - 1.1	0.041	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Di-n-butylphthalate	MG/KG	84-74-2	5 - 68	0.018 - 2.1	0.034 - 1.1	0.069	0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Phenanthrene	MG/KG	85-01-8	43 - 68	0.0022 - 0.66	0.007 - 0.21	0.025	0.0081 J	0.0039 J	0.0082 U	0.0084 U	0.0073 U	0.084	0.0097	0.0028 J	0.0072 U	0.0074 U
Phthalic anhydride	MG/KG	85-44-9	0 - 58	-	10 - 230		13 UJ	12 UJ	12 UJ	12 UJ	11 UJ	12 UJ	11 UJ	11 UJ	11 UJ	10 UJ
Butylbenzylphthalate	MG/KG	85-68-7	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	38 - 69	0.012 - 54	0.034 - 0.2	1.366	0.037 J	0.13 J	0.04 U	0.041 U	0.036 U	0.39	0.026 J	0.036 U	0.035 U	0.036 U
Fluorene	MG/KG	86-73-7	7 - 68	0.0019 - 0.022	0.007 - 0.21	0.011	0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.021	0.0019 J	0.0073 U	0.0072 U	0.0074 U
Carbazole	MG/KG	86-74-8	10 - 68	0.0017 - 0.055	0.007 - 0.21	0.010	0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.007 - 0.21		0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 UJ	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
Pentachlorophenol	MG/KG	87-86-5	0 - 68	-	0.036 - 5.4		0.22 U	0.2 UJ	0.21 U	0.21 U	0.18 U	0.43 UJ	0.19 U	0.19 U	0.18 U	0.19 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 UJ	0.038 U	0.036 U	0.035 U	0.036 U
2-Nitroaniline	MG/KG	88-74-4	0 - 68	-	0.18 - 5.4		0.22 U	0.2 U	0.21 U	0.21 U	0.18 U	0.43 U	0.19 U	0.19 U	0.18 U	0.19 U
2-Nitrophenol	MG/KG	88-75-5	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
1-Methylnaphthalene	MG/KG	90-12-0	6 - 68	0.002 - 0.06	0.007 - 0.072	0.009	0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.023	0.002 J	0.0073 U	0.0072 U	0.0074 U
Naphthalene	MG/KG	91-20-3	24 - 68	0.0014 - 0.54	0.007 - 0.21	0.022	0.0027 J	0.0045 J	0.0082 U	0.0084 U	0.0073 U	0.015 J	0.0024 J	0.0073 U	0.0072 U	0.0074 U
2-Methylnaphthalene	MG/KG	91-57-6	7 - 68	0.0019 - 0.1	0.007 - 0.19	0.011	0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.037	0.0019 J	0.0073 U	0.0023 J	0.0074 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 68	-	0.007 - 0.21		0.0087 U	0.0079 U	0.0082 U	0.0084 U	0.0073 U	0.017 U	0.0076 U	0.0073 U	0.0072 U	0.0074 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Biphenyl	MG/KG	92-52-4	21 - 68	0.0017 - 14	0.034 - 1.1	0.312	0.0026 J	0.0032 J	0.04 U	0.041 U	0.036 U	0.024 J	0.0078 J	0.036 U	0.035 U	0.036 U
2-Methylphenol	MG/KG	95-48-7	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
2-Chlorophenol	MG/KG	95-57-8	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 UJ	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 68	-	0.034 - 1.1		0.043 U	0.039 U	0.04 U	0.041 U	0.036 U	0.084 U	0.038 U	0.036 U	0.035 U	0.036 U
Acetophenone	MG/KG	98-86-2	6 - 68	0.0034 - 0.0083	0.036 - 2.1	0.075	0.087 U	0.079 U	0.082 U	0.084 U	0.073 UJ	0.17 U	0.0057 J	0.073 U	0.072 U	0.074 U
Nitrobenzene	MG/KG	98-95-3	0 - 68	-	0.036 - 2.1		0.086 U	0.079 U	0.082 U	0.083 U	0.072 UJ	0.17 U	0.076 U	0.073 U	0.072 U	0.074 U
3-Nitroaniline	MG/KG	99-09-2	0 - 68	-	0.18 - 5.4		0.22 U	0.2 U	0.21 U	0.21 U	0.18 U	0.43 U	0.19 U	0.19 U	0.18 U	0.19 U
Volatile Organic Compounds																
Ethylbenzene	MG/KG	100-41-4	7 - 68	0.00027 - 0.37	0.002 - 1.9	0.030	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Styrene	MG/KG	100-42-5	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-703 OC-SB-703-0_0/2_0-XXX 11/5/2019 0- 2	SB-703 OC-SB-703-2_0/4_0-XXX 11/5/2019 2- 4	SB-703 OC-SB-703-4_0/6_0-XXX 11/5/2019 4- 6	SB-703 OC-SB-703-6_0/8_0-XXX 11/5/2019 6- 8	SB-703 OC-SB-703-8_0/10-XXX 11/5/2019 8- 10	SB-704 OC-SB-704-0_0/2_0-XXX 11/7/2019 0- 2	SB-704 OC-SB-704-2_0/4_0-XXX 11/7/2019 2- 4	SB-704 OC-SB-704-4_0/6_0-XXX 11/7/2019 4- 6	SB-704 OC-SB-704-6_0/8_0-XXX 11/7/2019 6- 8	SB-704 OC-SB-704-8_0/10-XXX 11/7/2019 8- 10
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Propylbenzene	MG/KG	103-65-1	3 - 68	0.00049 - 0.007	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.00049 J	0.0041 U	0.0037 U	0.0045 U
n-Butylbenzene	MG/KG	104-51-8	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	36 - 68	0.00076 - 8	0.004 - 1.2	0.179	0.0009 J	0.0017 J-	0.0046 U	0.005 U	0.005 U	0.0051 J	0.0062	0.0013 J	0.0037 U	0.0045 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	27 - 68	0.00056 - 6.3	0.004 - 1.2	0.143	0.0047 U	0.00067 J-	0.0046 U	0.005 U	0.005 U	0.0073 U	0.003 J	0.00056 J	0.0037 U	0.0045 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 68	-	0.018 - 9.3		0.024 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.037 U	0.027 U	0.02 U	0.019 U	0.023 U
Isopropyl ether	MG/KG	108-20-3	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	6 - 68	0.00037 - 0.0014	0.002 - 1.9	0.032	0.0047 U	0.00037 J-	0.0046 U	0.005 U	0.005 U	0.0014 J	0.0011 J	0.0041 U	0.0037 U	0.0045 U
Bromobenzene	MG/KG	108-86-1	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Toluene	MG/KG	108-88-3	10 - 68	0.00029 - 0.0042	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0014 J	0.0042 J	0.0005 J	0.00038 J	0.0045 U
Chlorobenzene	MG/KG	108-90-7	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 68	-	0.023 - 19		0.047 U	0.044 UJ	0.046 U	0.05 U	0.05 U	0.073 U	0.054 U	0.041 U	0.037 U	0.045 U
Cyclohexane	MG/KG	110-82-7	0 - 68	-	0.018 - 9.3		0.024 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.037 U	0.027 U	0.02 U	0.019 U	0.023 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	10 - 68	0.00036 - 0.0025	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.00058 J	0.00036 J	0.0037 U	0.0045 U
1,4-Dioxane	MG/KG	123-91-1	0 - 68	-	0.18 - 93		0.24 U	0.22 UJ	0.23 U	0.25 U	0.25 U	0.37 U	0.27 U	0.2 U	0.19 U	0.23 U
Dibromochloromethane	MG/KG	124-48-1	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Tetrachloroethene	MG/KG	127-18-4	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Xylenes, Total	MG/KG	1330-20-7	7 - 68	0.00075 - 0.0026	0.004 - 1.9	0.032	0.0047 U	0.00077 J-	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Xylenes (m&p)	MG/KG	179601-23-1	7 - 68	0.00075 - 0.0014	0.004 - 1.9	0.032	0.0047 U	0.00077 J-	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 68	0.00032 - 0.0004	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
2-Hexanone	MG/KG	591-78-6	0 - 68	-	0.018 - 9.3		0.024 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.037 U	0.027 U	0.02 U	0.019 U	0.023 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Diethyl ether	MG/KG	60-29-7	2 - 68	0.0028 - 0.0034	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0034 J	0.0028 J	0.0041 U	0.0037 U	0.0045 U
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Acetone	MG/KG	67-64-1	38 - 68	0.0042 - 0.099	0.19 - 93	1.580	0.03 J	0.037 J-	0.0065 J	0.023 J	0.0042 J	0.093 J	0.068 J	0.064 J	0.038 J	0.054 J
Chloroform	MG/KG	67-66-3	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Benzene	MG/KG	71-43-2	5 - 68	0.0002 - 0.0008	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.00041 J	0.0041 U	0.0037 U	0.0045 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Bromomethane	MG/KG	74-83-9	0 - 68	-	0.004 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Chloromethane	MG/KG	74-87-3	0 - 68	-	0.004 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Dibromomethane	MG/KG	74-95-3	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Bromochloromethane	MG/KG	74-97-5	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Chloroethane	MG/KG	75-00-3	0 - 68	-	0.004 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Vinyl chloride	MG/KG	75-01-4	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Methylene chloride	MG/KG	75-09-2	0 - 68	-	0.004 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.014 U	0.011 U	0.0061 U	0.0047 U	0.0088 U
Carbon disulfide	MG/KG	75-15-0	10 - 68	0.0024 - 0.0066	0.002 - 1.9	0.032	0.0047 U	0.0044 J-	0.0046 U	0.005 U	0.005 U	0.0073 U	0.006	0.0025 J	0.0037 U	0.0024 J
Bromoform	MG/KG	75-25-2	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Bromodichloromethane	MG/KG	75-27-4	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1-Dichloroethane	MG/KG	75-34-3	2 - 68	0.0007 - 0.0008	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 68	-	0.004 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 68	-	0.004 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 68	-	0.004 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
2-Butanone	MG/KG	78-93-3	26 - 68	0.0044 - 0.56	0.018 - 9.3	0.173	0.0066 J	0.01 J	0.023 U	0.025 U	0.025 U	0.017 J+	0.023 J+	0.064 J+	0.0096 J+	0.029 J+
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Trichloroethene	MG/KG	79-01-6	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 68	0.0063 - 0.33	0.037 - 19	0.255	0.047 U	0.044 UJ	0.046 U	0.05 U	0.05 U	0.073 U	0.054 U	0.041 U	0.037 U	0.045 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-703 OC-SB-703-0_0/2_0-XXX 11/5/2019 0- 2	SB-703 OC-SB-703-2_0/4_0-XXX 11/5/2019 2- 4	SB-703 OC-SB-703-4_0/6_0-XXX 11/5/2019 4- 6	SB-703 OC-SB-703-6_0/8_0-XXX 11/5/2019 6- 8	SB-703 OC-SB-703-8_0/10-XXX 11/5/2019 8- 10	SB-704 OC-SB-704-0_0/2_0-XXX 11/7/2019 0- 2	SB-704 OC-SB-704-2_0/4_0-XXX 11/7/2019 2- 4	SB-704 OC-SB-704-4_0/6_0-XXX 11/7/2019 4- 6	SB-704 OC-SB-704-6_0/8_0-XXX 11/7/2019 6- 8	SB-704 OC-SB-704-8_0/10-XXX 11/7/2019 8- 10
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Naphthalene	MG/KG	91-20-3	8 - 68	0.0009 - 0.18	0.018 - 9.3	0.128	0.024 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.0025 J	0.0014 J	0.02 U	0.019 U	0.023 U
Xylene, o	MG/KG	95-47-6	2 - 68	0.00075 - 0.0016	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	4 - 68	0.0027 - 0.016	0.002 - 1.9	0.032	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.003 J	0.0027 J	0.0041 U	0.0037 U	0.0045 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 68	-	0.018 - 9.3		0.024 U	0.022 UJ	0.023 U	0.025 U	0.025 U	0.037 U	0.027 U	0.02 U	0.019 U	0.023 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
Isopropylbenzene	MG/KG	98-82-8	4 - 68	0.0012 - 0.2	0.002 - 1.9	0.028	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0013 J	0.0041 U	0.0037 U	0.0045 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 68	-	0.002 - 1.9		0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0073 U	0.0054 U	0.0041 U	0.0037 U	0.0045 U
4-iso-Propyltoluene	MG/KG	99-87-6	8 - 68	0.00041 - 0.42	0.002 - 1.9	0.031	0.0047 U	0.0044 UJ	0.0046 U	0.005 U	0.005 U	0.0019 J	0.0012 J	0.0041 U	0.0037 U	0.0045 U
Hydrazine/aldehydes																
Hydrazine	MG/KG	302-01-2	31 - 63	0.00062 - 0.086	0.002 - 0.007	0.005	0.0067 U	0.0074 J	0.0066 U	0.0058 U	0.0058 U	0.086	0.019	0.0013 J	0.0055 U	0.0017 J
Formaldehyde	MG/KG	50-00-0	26 - 63	0.096 - 11	0.11 - 2.6	1.612	1.8 J	2.9 J	2.5 U	2.5 U	2.2 U	2.5 U	2.7	2.2 U	2.2 U	1.6 J
UDMH	MG/KG	57-14-7	0 - 63	-	0.005 - 0.007		0.0067 U	0.0058 U	0.0066 U	0.0058 U	0.0058 U	0.007 U	0.006 U	0.0057 U	0.0055 U	0.0053 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 63	-	0.005 - 0.007		0.0067 U	0.0058 U	0.0066 U	0.0058 UJ	0.0058 UJ	0.007 UJ	0.006 UJ	0.0057 U	0.0055 U	0.0053 U
Acetaldehyde	MG/KG	75-07-0	0 - 5	-	0.23 - 0.24											

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-0_0/2_0-XXX 11/8/2019 0- 2	SB-705 OC-SB-705-2_0/4_0-XXX 11/8/2019 2- 4	SB-705 OC-SB-705-4_0/6_0-XXX 11/8/2019 4- 6	SB-705 OC-SB-705-6_0/8_0-XXX 11/8/2019 6- 8	SB-705 OC-SB-705-8_0/10-XXX 11/8/2019 8- 10	SB-706 OC-SB-706-0_0/2_0-XXX 11/6/2019 0- 2	SB-706 OC-SB-706-2_0/4_0-XXX 11/6/2019 2- 4	SB-706 OC-SB-706-4_0/6_0-XXX 11/6/2019 4- 6	SB-706 OC-SB-706-6_0/8_0-XXX 11/6/2019 6- 8	SB-707 OC-SB-707-0_0/2_0-XXX 11/7/2019 0- 2
Dimethylformamide																
Dimethylformamide	MG/KG	68-12-2	0 - 63	-	0.14 - 0.84		0.17 U	0.17 U	0.2 U	0.15 U	0.2 U	0.2 U	0.18 U	0.16 U	0.17 U	0.17 U
Inorganics																
Sulfate	MG/KG	14808-79-8	58 - 58	12 - 18000	- - -	2914	77 J	1400 J	3400 J	160	190	1000 J-	410 J	120 J	160 J	170 J
Chloride	MG/KG	16887-00-6	18 - 58	4.1 - 19	10 - 13	6.39	11 UJ	11 UJ	13 U	11 U	11 U	11 UJ	11 UJ	7 J	4.8 J	5.2 J
Ammonia	MG/KG	7664-41-7	55 - 58	3.5 - 58	6.6 - 9.9	15.25	3.8 J	5.8	7.5	8.2	29	10	14	9.6	12	6
Sulfate	MG/KG	14808-79-8	10 - 10	57 - 13000	- -	3460										
Chloride	MG/KG	16887-00-6	1 - 10	44 - 44	15 - 25	13.35										
Total Organic Carbon	MG/KG	HLA0011	1 - 1	9400 - 9400	- - -	9400										
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37										
Metals & Inorganics																
Chromium, Hexavalent	MG/KG	18540-29-9	54 - 58	0.18 - 20.8	0.44 - 0.49	2.59	0.46 U	1.1	1.5 J	7.4	9.9	0.95	2.9	6.6	20.8	2.7
Aluminum	MG/KG	7429-90-5	68 - 68	2100 - 15000	- - -	7328	5100	5400	5900 J+	3700	5800	5000	13000	9000	11000	8300
Iron	MG/KG	7439-89-6	68 - 68	2700 - 23000	- - -	9543	6400	6100	7700 J+	4900	9000	7000	16000	12000	23000	16000
Lead	MG/KG	7439-92-1	68 - 68	1.7 - 22	- - -	6.92	3.9	6.3	7.9	2.2	3.2	4.7	8.2	5.6	21	11
Magnesium	MG/KG	7439-95-4	68 - 68	820 - 7300	- - -	2642	1600	1800	1900	920	2500	1700	6200	2700	4200	3000
Manganese	MG/KG	7439-96-5	68 - 68	31 - 370	- - -	128.24	83	60	98 J+	55	100	87	210	130	180	110
Mercury	MG/KG	7439-97-6	30 - 68	0.0086 - 0.19	0.019 - 0.21	0.04	0.022 U	0.028	0.026 J	0.022 U	0.022 U	0.011 J	0.09	0.022 U	0.022 U	0.042
Nickel	MG/KG	7440-02-0	68 - 68	2.5 - 40	- - -	11.55	6.1	7.6	8.1	4.7 J	11	6.3	23	12	17	15
Silver	MG/KG	7440-22-4	10 - 68	0.13 - 1.2	0.61 - 0.82	0.39	0.69 U	0.67 U	0.82 U	0.68 U	0.64 U	0.66 U	0.66 U	0.68 U	0.66 U	0.75 U
Sodium	MG/KG	7440-23-5	60 - 68	46 - 470	150 - 180	144.91	90 J	60 J	67 J	69 J	140 J	82 J	220	210	330	86 J
Thallium	MG/KG	7440-28-0	0 - 68	-	1.1 - 8.2		6.9 U	6.7 U	8.2 U	6.8 U	6.4 U	6.6 U	6.6 U	6.8 U	6.6 U	7.5 U
Tin	MG/KG	7440-31-5	46 - 68	0.5 - 36	2.1 - 2.7	4.07	0.52 J	2.2 U	0.69 J	2.3 U	2.1 U	0.59 J	0.78 J	2.3 U	0.81 J	0.61 J
Antimony	MG/KG	7440-36-0	17 - 68	0.45 - 1.2	0.57 - 83	5.97	17 U	17 U	20 U	17 U	16 U	0.63 J	1.1 J	0.95 J	83 U	1 J
Arsenic	MG/KG	7440-38-2	68 - 68	0.76 - 33	- - -	8.47	14	7.1	6.6	6.5	4.4	11	7.6	6.2	17	33
Barium	MG/KG	7440-39-3	68 - 68	6.6 - 89	- - -	33.80	12	17	16	9.3	23	16	43	34	41	28
Beryllium	MG/KG	7440-41-7	68 - 68	0.08 - 0.67	- - -	0.32	0.28	0.22	0.23 J	0.14 J	0.34 J	0.27	0.39	0.35	0.48	0.38
Cadmium	MG/KG	7440-43-9	44 - 68	0.035 - 9.3	0.21 - 0.26	0.40	0.17 J	0.26	0.45	0.23 U	0.21 U	0.5	0.22 U	0.23 U	0.22 U	0.18 J
Chromium	MG/KG	7440-47-3	68 - 68	5.3 - 1300	- - -	97.51	13	21	77 J	410	250	19	200	890	1300	79
Cobalt	MG/KG	7440-48-4	68 - 68	0.79 - 13	- - -	4.03	1.9	2.4	2.9	2.1	3.9	2.2	9.1	4.4	6.8	5.7
Copper	MG/KG	7440-50-8	68 - 68	0.75 - 27	- - -	8.89	4.5	5	5.5	5	11	5.7	27	11	25	11
Vanadium	MG/KG	7440-62-2	68 - 68	5.2 - 40	- - -	15.83	9.3	10	12	7	16	10	40	19	35	19
Zinc	MG/KG	7440-66-6	68 - 68	6.4 - 78	- - -	22.89	11	25	22	7.5	18	14	27	23	46	28
Calcium	MG/KG	7440-70-2	68 - 68	550 - 110000	- - -	10629	1200	1600	3600 J+	1200	1800	1600	3500	1700	3800	12000
Selenium	MG/KG	7782-49-2	10 - 68	0.5 - 1.1	0.57 - 5.5	1.78	0.52 J	4.5 U	5.5 U	0.79 J	4.3 U	0.82 J	4.4 U	4.6 U	4.4 U	5 U
Potassium	MG/KG	9/7/7440	68 - 68	340 - 4300	- - -	1220	650	970	700	380	950	750	2000	1500	2000	890
Phthalates																
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	-	0.11 - 0.12											
Semi-Volatile Organic Compounds																
4-Nitroaniline	MG/KG	100-01-6	0 - 68	-	0.18 - 5.4		0.2 U	0.59 U	5.4 U	0.19 U	0.18 U	0.37 U	1.8 U	0.18 U	0.37 U	0.82 U
4-Nitrophenol	MG/KG	100-02-7	0 - 68	-	0.18 - 5.4		0.2 U	0.59 U	5.4 U	0.19 U	0.18 U	0.37 U	1.8 U	0.18 U	0.37 U	0.82 U
Benzyl alcohol	MG/KG	100-51-6	1 - 68	0.059 - 0.059	0.034 - 1.1	0.044	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Benzaldehyde	MG/KG	100-52-7	7 - 68	0.0067 - 0.23	0.036 - 2.1	0.080	0.078 R	0.23 J-	2.1 U	0.076 U	0.072 U	0.15 R	0.72 R	0.072 R	0.15 R	0.33 R
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 68	0.19 - 0.19	0.034 - 1.1	0.041	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.19 J	0.036 U	0.072 U	0.16 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.044	0.019										
Azobenzene	MG/KG	103-33-3	0 - 68	-	0.036 - 7.5		0.38 U	1.8 U	2.1 U	0.37 U	0.36 U	0.36 U	3.6 U	0.36 U	0.35 U	0.41 U
Caprolactam	MG/KG	105-60-2	0 - 68	-	0.036 - 5.4		0.2 U	0.59 U	5.4 U	0.19 U	0.18 U	0.37 U	1.8 U	0.18 U	0.37 U	0.82 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 68	0.0039 - 0.012	0.034 - 1.1	0.040	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
4-Chloroaniline	MG/KG	106-47-8	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 68	-	0.007 - 0.21		0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Phenol	MG/KG	108-95-2	13 - 68	0.011 - 8.8	0.034 - 1.1	0.182	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 68	-	0.007 - 0.21		0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	54 - 68	0.043 - 420	0.34 - 0.41	13.127	0.11 J	2.4	2.1 J	0.37 U	0.35 U	0.77	370	0.17 J	0.21 J	8.1
Di-n-octylphthalate	MG/KG	117-84-0	2 - 68	0.023 - 0.061	0.034 - 1.1	0.041	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 68	-	0.007 - 0.21		0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Diphenylmethanone	MG/KG	119-61-9	0 - 10	-	0.036 - 0.044											
Anthracene	MG/KG	120-12-7	13 - 68	0.0021 - 0.06	0.007 - 0.21	0.010	0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	12 - 68	0.0017 - 0.068	0.034 - 1.1	0.037	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.0049 J	0.35 U	0.036 U	0.072 U	0.068 J
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 68	-	0.007 - 0.21		0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-0_0/2_0-XXX 11/8/2019 0- 2	SB-705 OC-SB-705-2_0/4_0-XXX 11/8/2019 2- 4	SB-705 OC-SB-705-4_0/6_0-XXX 11/8/2019 4- 6	SB-705 OC-SB-705-6_0/8_0-XXX 11/8/2019 6- 8	SB-705 OC-SB-705-8_0/10-XXX 11/8/2019 8- 10	SB-706 OC-SB-706-0_0/2_0-XXX 11/6/2019 0- 2	SB-706 OC-SB-706-2_0/4_0-XXX 11/6/2019 2- 4	SB-706 OC-SB-706-4_0/6_0-XXX 11/6/2019 4- 6	SB-706 OC-SB-706-6_0/8_0-XXX 11/6/2019 6- 8	SB-707 OC-SB-707-0_0/2_0-XXX 11/7/2019 0- 2
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.039	0.018										
Pyrene	MG/KG	129-00-0	38 - 68	0.0017 - 0.15	0.007 - 0.21	0.018	0.0042 J	0.012 J	0.21 U	0.0076 U	0.0072 U	0.0069 J	0.068 J	0.0072 U	0.015 U	0.031 J
Dimethylphthalate	MG/KG	131-11-3	1 - 68	0.002 - 0.002	0.034 - 1.1	0.040	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Dibenzofuran	MG/KG	132-64-9	3 - 68	0.0088 - 0.029	0.034 - 1.1	0.037	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.029 J	0.036 U	0.072 U	0.16 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	-	0.036 - 0.044											
Atrazine	MG/KG	1912-24-9	0 - 68	-	0.036 - 2.1		0.078 U	0.23 U	2.1 U	0.076 U	0.072 U	0.15 U	0.72 U	0.072 U	0.15 U	0.33 U
Benzo(ghi)perylene	MG/KG	191-24-2	22 - 68	0.0018 - 0.056	0.007 - 0.21	0.012	0.0018 J	0.0054 J	0.21 U	0.0076 U	0.0072 U	0.0038 J	0.072 U	0.0072 U	0.015 U	0.016 J
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	21 - 68	0.0017 - 0.038	0.007 - 0.21	0.012	0.0017 J	0.023 U	0.21 U	0.0076 U	0.0072 U	0.0032 J	0.072 U	0.0072 U	0.015 U	0.017 J
Benzo(b)fluoranthene	MG/KG	205-99-2	29 - 68	0.0021 - 0.068	0.007 - 0.21	0.014	0.0031 J	0.0082 J	0.21 U	0.0076 U	0.0072 U	0.0068 J	0.072 U	0.0072 U	0.015 U	0.022 J
Fluoranthene	MG/KG	206-44-0	40 - 68	0.0028 - 0.16	0.007 - 0.21	0.018	0.0047 J	0.011 J	0.21 U	0.0076 U	0.0072 U	0.0066 J	0.046 J	0.0072 U	0.015 U	0.021 J
Benzo(k)fluoranthene	MG/KG	207-08-9	15 - 68	0.003 - 0.032	0.007 - 0.21	0.011	0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Acenaphthylene	MG/KG	208-96-8	7 - 68	0.0016 - 0.0063	0.007 - 0.21	0.010	0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Chrysene	MG/KG	218-01-9	31 - 68	0.0021 - 0.075	0.007 - 0.21	0.014	0.0028 J	0.0076 J	0.21 U	0.0076 U	0.0072 U	0.0056 J	0.072 U	0.0072 U	0.015 U	0.019 J
Benzo(a)pyrene	MG/KG	50-32-8	23 - 68	0.0026 - 0.067	0.007 - 0.21	0.013	0.0026 J	0.023 U	0.21 U	0.0076 U	0.0072 U	0.0047 J	0.072 U	0.0072 U	0.015 U	0.011 J
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 68	-	0.036 - 11		0.39 U	1.1 U	11 U	0.37 U	0.35 U	0.72 U	3.5 U	0.36 U	0.72 U	1.6 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 68	-	0.18 - 5.4		0.2 U	0.59 U	5.4 U	0.19 U	0.18 U	0.37 U	1.8 U	0.18 U	0.37 U	0.82 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	9 - 68	0.0021 - 0.012	0.007 - 0.21	0.010	0.0026 J	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Benzo(a)anthracene	MG/KG	56-55-3	31 - 68	0.0014 - 0.072	0.007 - 0.21	0.013	0.003 J	0.0089 J	0.21 U	0.0076 U	0.0072 U	0.0053 J	0.072 U	0.0072 U	0.015 U	0.017 J
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 68	-	0.007 - 0.21		0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Aniline	MG/KG	62-53-3	1 - 68	0.017 - 0.017	0.034 - 1.1	0.041	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 68	-	0.006 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Benzoic Acid	MG/KG	65-85-0	0 - 68	-	0.18 - 5.4		0.2 U	0.59 U	5.4 U	0.19 U	0.18 U	0.37 U	1.8 U	0.18 U	0.37 U	0.82 U
Hexachloroethane	MG/KG	67-72-1	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	2 - 68	0.0064 - 0.031	0.034 - 1.1	0.040	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Isophorone	MG/KG	78-59-1	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Acenaphthene	MG/KG	83-32-9	3 - 68	0.0055 - 0.017	0.007 - 0.21	0.011	0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Diethylphthalate	MG/KG	84-66-2	2 - 68	0.02 - 0.025	0.034 - 1.1	0.041	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Di-n-butylphthalate	MG/KG	84-74-2	5 - 68	0.018 - 2.1	0.034 - 1.1	0.069	0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	2.1	0.036 U	0.072 U	0.16 U
Phenanthrene	MG/KG	85-01-8	43 - 68	0.0022 - 0.66	0.007 - 0.21	0.025	0.0048 J	0.0078 J	0.21 U	0.0076 U	0.0072 U	0.0045 J	0.15	0.0045 J	0.0045 J	0.016 J
Phthalic anhydride	MG/KG	85-44-9	0 - 58	-	10 - 230		11 UJ	56 UJ	65 UJ	11 UJ	11 UJ	11 UJ	110 UJ	11 UJ	11 UJ	12 UJ
Butylbenzylphthalate	MG/KG	85-68-7	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	38 - 69	0.012 - 54	0.034 - 0.2	1.366	0.039 U	0.4	2.7	0.037 U	0.035 U	0.052 J	28 J	0.036 U	0.025 J	0.51
Fluorene	MG/KG	86-73-7	7 - 68	0.0019 - 0.022	0.007 - 0.21	0.011	0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Carbazole	MG/KG	86-74-8	10 - 68	0.0017 - 0.055	0.007 - 0.21	0.010	0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.055 J	0.0072 U	0.015 U	0.033 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.007 - 0.21		0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
Pentachlorophenol	MG/KG	87-86-5	0 - 68	-	0.036 - 5.4		0.2 U	0.59 U	5.4 U	0.19 U	0.18 U	0.37 U	1.8 U	0.18 U	0.37 U	0.82 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
2-Nitroaniline	MG/KG	88-74-4	0 - 68	-	0.18 - 5.4		0.2 U	0.59 U	5.4 U	0.19 U	0.18 U	0.37 U	1.8 U	0.18 U	0.37 U	0.82 U
2-Nitrophenol	MG/KG	88-75-5	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
1-Methylnaphthalene	MG/KG	90-12-0	6 - 68	0.002 - 0.06	0.007 - 0.072	0.009	0.0078 U	0.023 U	0.06 J	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.0084 J
Naphthalene	MG/KG	91-20-3	24 - 68	0.0014 - 0.54	0.007 - 0.21	0.022	0.0078 U	0.0046 J	0.21 U	0.0076 U	0.0072 U	0.0045 J	0.072 U	0.0072 U	0.015 U	0.0073 J
2-Methylnaphthalene	MG/KG	91-57-6	7 - 68	0.0019 - 0.1	0.007 - 0.19	0.011	0.0078 U	0.023 U	0.1 J	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.01 J
2-Chloronaphthalene	MG/KG	91-58-7	0 - 68	-	0.007 - 0.21		0.0078 U	0.023 U	0.21 U	0.0076 U	0.0072 U	0.015 U	0.072 U	0.0072 U	0.015 U	0.033 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Biphenyl	MG/KG	92-52-4	21 - 68	0.0017 - 14	0.034 - 1.1	0.312	0.039 U	0.033 J	1.1 U	0.037 U	0.035 U	0.0053 J	5.5	0.036 U	0.072 U	0.019 J
2-Methylphenol	MG/KG	95-48-7	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
2-Chlorophenol	MG/KG	95-57-8	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 68	-	0.034 - 1.1		0.039 U	0.11 U	1.1 U	0.037 U	0.035 U	0.072 U	0.35 U	0.036 U	0.072 U	0.16 U
Acetophenone	MG/KG	98-86-2	6 - 68	0.0034 - 0.0083	0.036 - 2.1	0.075	0.078 U	0.23 U	2.1 U	0.076 U	0.072 U	0.0044 J	0.72 U	0.072 U	0.15 U	0.33 U
Nitrobenzene	MG/KG	98-95-3	0 - 68	-	0.036 - 2.1		0.078 U	0.23 U	2.1 U	0.076 U	0.072 U	0.15 U	0.71 U	0.072 U	0.15 U	0.32 U
3-Nitroaniline	MG/KG	99-09-2	0 - 68	-	0.18 - 5.4		0.2 U	0.59 U	5.4 U	0.19 U	0.18 U	0.37 U	1.8 U	0.18 U	0.37 U	0.82 U
Volatile Organic Compounds																
Ethylbenzene	MG/KG	100-41-4	7 - 68	0.00027 - 0.37	0.002 - 1.9	0.030	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Styrene	MG/KG	100-42-5	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-0_0/2_0-XXX 11/8/2019 0- 2	SB-705 OC-SB-705-2_0/4_0-XXX 11/8/2019 2- 4	SB-705 OC-SB-705-4_0/6_0-XXX 11/8/2019 4- 6	SB-705 OC-SB-705-6_0/8_0-XXX 11/8/2019 6- 8	SB-705 OC-SB-705-8_0/10-XXX 11/8/2019 8- 10	SB-706 OC-SB-706-0_0/2_0-XXX 11/6/2019 0- 2	SB-706 OC-SB-706-2_0/4_0-XXX 11/6/2019 2- 4	SB-706 OC-SB-706-4_0/6_0-XXX 11/6/2019 4- 6	SB-706 OC-SB-706-6_0/8_0-XXX 11/6/2019 6- 8	SB-707 OC-SB-707-0_0/2_0-XXX 11/7/2019 0- 2
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Propylbenzene	MG/KG	103-65-1	3 - 68	0.00049 - 0.007	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
n-Butylbenzene	MG/KG	104-51-8	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	36 - 68	0.00076 - 8	0.004 - 1.2	0.179	0.0042 U	0.0055	0.0074 J-	0.0043 U	0.0037 U	0.0045 U	0.0013 J	0.0019 J	0.0037 U	0.0052 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	27 - 68	0.00056 - 6.3	0.004 - 1.2	0.143	0.0042 U	0.0021 J	0.0023 J-	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 68	-	0.018 - 9.3		0.021 U	0.022 U	0.024 UJ	0.021 U	0.019 U	0.023 U	0.021 U	0.019 U	0.019 U	0.026 U
Isopropyl ether	MG/KG	108-20-3	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	6 - 68	0.00037 - 0.0014	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Bromobenzene	MG/KG	108-86-1	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Toluene	MG/KG	108-88-3	10 - 68	0.00029 - 0.0042	0.002 - 1.9	0.032	0.0042 U	0.00048 J	0.0006 J	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Chlorobenzene	MG/KG	108-90-7	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 68	-	0.023 - 19		0.042 U	0.043 U	0.048 UJ	0.043 U	0.037 U	0.045 U	0.042 U	0.039 U	0.037 U	0.052 U
Cyclohexane	MG/KG	110-82-7	0 - 68	-	0.018 - 9.3		0.021 U	0.022 U	0.024 U	0.021 U	0.019 U	0.023 U	0.021 U	0.019 U	0.019 U	0.026 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	10 - 68	0.00036 - 0.0025	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0025 J
1,4-Dioxane	MG/KG	123-91-1	0 - 68	-	0.18 - 93		0.21 U	0.22 U	0.24 U	0.21 U	0.19 U	0.23 U	0.21 U	0.19 U	0.19 U	0.26 U
Dibromochloromethane	MG/KG	124-48-1	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Tetrachloroethene	MG/KG	127-18-4	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Xylenes, Total	MG/KG	1330-20-7	7 - 68	0.00075 - 0.0026	0.004 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Xylenes (m&p)	MG/KG	179601-23-1	7 - 68	0.00075 - 0.0014	0.004 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 68	0.00032 - 0.0004	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
2-Hexanone	MG/KG	591-78-6	0 - 68	-	0.018 - 9.3		0.021 U	0.022 U	0.024 UJ	0.021 U	0.019 U	0.023 U	0.021 U	0.019 U	0.019 U	0.026 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Diethyl ether	MG/KG	60-29-7	2 - 68	0.0028 - 0.0034	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Acetone	MG/KG	67-64-1	38 - 68	0.0042 - 0.099	0.19 - 93	1.580	0.014 J	0.046 J	0.074 J-	0.018 J	0.19 U	0.23 U	0.21 U	0.19 U	0.19 U	0.26 U
Chloroform	MG/KG	67-66-3	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Benzene	MG/KG	71-43-2	5 - 68	0.0002 - 0.0008	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Bromomethane	MG/KG	74-83-9	0 - 68	-	0.004 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Chloromethane	MG/KG	74-87-3	0 - 68	-	0.004 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Dibromomethane	MG/KG	74-95-3	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Bromochloromethane	MG/KG	74-97-5	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Chloroethane	MG/KG	75-00-3	0 - 68	-	0.004 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Vinyl chloride	MG/KG	75-01-4	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Methylene chloride	MG/KG	75-09-2	0 - 68	-	0.004 - 1.9		0.0097 U	0.0062 U	0.0073 U	0.029 U	0.026 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Carbon disulfide	MG/KG	75-15-0	10 - 68	0.0024 - 0.0066	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Bromoform	MG/KG	75-25-2	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Bromodichloromethane	MG/KG	75-27-4	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,1-Dichloroethane	MG/KG	75-34-3	2 - 68	0.0007 - 0.0008	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 68	-	0.004 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 68	-	0.004 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 68	-	0.004 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
2-Butanone	MG/KG	78-93-3	26 - 68	0.0044 - 0.56	0.018 - 9.3	0.173	0.021 U	0.014 J+	0.02 J+	0.56 J+	0.019 U	0.023 U	0.015 J+	0.0082 J	0.019 U	0.015 J
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Trichloroethene	MG/KG	79-01-6	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 68	0.0063 - 0.33	0.037 - 19	0.255	0.042 U	0.043 U	0.048 UJ	0.041 J	0.037 U	0.045 U	0.042 U	0.039 U	0.037 U	0.052 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-705 OC-SB-705-0_0/2_0-XXX 11/8/2019 0- 2	SB-705 OC-SB-705-2_0/4_0-XXX 11/8/2019 2- 4	SB-705 OC-SB-705-4_0/6_0-XXX 11/8/2019 4- 6	SB-705 OC-SB-705-6_0/8_0-XXX 11/8/2019 6- 8	SB-705 OC-SB-705-8_0/10-XXX 11/8/2019 8- 10	SB-706 OC-SB-706-0_0/2_0-XXX 11/6/2019 0- 2	SB-706 OC-SB-706-2_0/4_0-XXX 11/6/2019 2- 4	SB-706 OC-SB-706-4_0/6_0-XXX 11/6/2019 4- 6	SB-706 OC-SB-706-6_0/8_0-XXX 11/6/2019 6- 8	SB-707 OC-SB-707-0_0/2_0-XXX 11/7/2019 0- 2
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Naphthalene	MG/KG	91-20-3	8 - 68	0.0009 - 0.18	0.018 - 9.3	0.128	0.021 U	0.022 U	0.024 UJ	0.021 U	0.019 U	0.023 U	0.021 U	0.019 U	0.019 U	0.026 U
Xylene, o	MG/KG	95-47-6	2 - 68	0.00075 - 0.0016	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	4 - 68	0.0027 - 0.016	0.002 - 1.9	0.032	0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 68	-	0.018 - 9.3		0.021 U	0.022 U	0.024 UJ	0.021 U	0.019 U	0.023 U	0.021 U	0.019 U	0.019 U	0.026 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 UJ	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Isopropylbenzene	MG/KG	98-82-8	4 - 68	0.0012 - 0.2	0.002 - 1.9	0.028	0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 68	-	0.002 - 1.9		0.0042 U	0.0043 U	0.0048 U	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
4-iso-Propyltoluene	MG/KG	99-87-6	8 - 68	0.00041 - 0.42	0.002 - 1.9	0.031	0.0042 U	0.0043 U	0.00052 J-	0.0043 U	0.0037 U	0.0045 U	0.0042 U	0.0039 U	0.0037 U	0.0052 U
Hydrazine/aldehydes																
Hydrazine	MG/KG	302-01-2	31 - 63	0.00062 - 0.086	0.002 - 0.007	0.005	0.0056 U	0.0056 U	0.0017 J	0.0055 U	0.0058 U	0.0054 U	0.0057 U	0.0056 U	0.0055 U	0.0056 J
Formaldehyde	MG/KG	50-00-0	26 - 63	0.096 - 11	0.11 - 2.6	1.612	1.4 J	2.2 U	5.4 J	1.5 J	2.2 UJ	2.3 UJ	2.2 UJ	2.2 UJ	2.2 UJ	3.2 J
UDMH	MG/KG	57-14-7	0 - 63	-	0.005 - 0.007		0.0056 U	0.0056 U	0.0058 U	0.0055 U	0.0058 U	0.0054 U	0.0057 U	0.0056 U	0.0055 U	0.0061 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 63	-	0.005 - 0.007		0.0056 U	0.0056 U	0.0058 UJ	0.0055 U	0.0058 U	0.0054 U	0.0057 U	0.0056 U	0.0055 U	0.0061 U
Acetaldehyde	MG/KG	75-07-0	0 - 5	-	0.23 - 0.24											

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-707 OC-SB-707-2_0/4_0-XXX 11/7/2019 2- 4	SB-707 OC-SB-707-4_0/6_0-XXX 11/7/2019 4- 6	SB-707 OC-SB-707-6_0/8_0-XXX 11/7/2019 6- 8	SB-707 OC-SB-707-8_0/10-XXX 11/7/2019 8- 10	SB-708 OC-SB-708-0_0/2_0-XXX 11/4/2019 0- 2	SB-708 OC-SB-708-2_0/4_0-XXX 11/4/2019 2- 4	SB-708 OC-SB-708-4_0/6_0-XXX 11/4/2019 4- 6	SB-708 OC-SB-708-6_0/8_0-XXX 11/4/2019 6- 8	SB-708 OC-SB-708-8_0/10-XXX 11/4/2019 8- 10	SB-709 OC-SB-709-0_0/2_0-XXX 11/6/2019 0- 2
Dimethylformamide																
Dimethylformamide	MG/KG	68-12-2	0 - 63	-	0.14 - 0.84		0.22 U	0.16 U	0.15 U	0.14 U	0.2 U	0.21 U	0.18 U	0.21 U	0.21 U	0.2 U
Inorganics																
Sulfate	MG/KG	14808-79-8	58 - 58	12 - 18000	- - -	2914	2100 J	7100 J	130 J	190	430 J	590 J	190 J	1800 J	57 J	1300
Chloride	MG/KG	16887-00-6	18 - 58	4.1 - 19	10 - 13	6.39	11 UJ	11 UJ	4.1 J	9.9 J	11 UJ	12 UJ	11 UJ	10 UJ	10 UJ	12 U
Ammonia	MG/KG	7664-41-7	55 - 58	3.5 - 58	6.6 - 9.9	15.25	13	6.5	5.6 J-	7.5	7.3 U	18	6.6 U	15	9.9 U	4.1 J
Sulfate	MG/KG	14808-79-8	10 - 10	57 - 13000	- -	3460										
Chloride	MG/KG	16887-00-6	1 - 10	44 - 44	15 - 25	13.35										
Total Organic Carbon	MG/KG	HLA0011	1 - 1	9400 - 9400	- - -	9400										
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37										
Metals & Inorganics																
Chromium, Hexavalent	MG/KG	18540-29-9	54 - 58	0.18 - 20.8	0.44 - 0.49	2.59	1	7.6	3.4	4.2	4.9	0.7	0.76	0.72	0.8	2.2
Aluminum	MG/KG	7429-90-5	68 - 68	2100 - 15000	- - -	7328	14000	6400	7400 J+	7700	8600	5200	11000	7300	12000	8400
Iron	MG/KG	7439-89-6	68 - 68	2700 - 23000	- - -	9543	19000	7700	9500	7800	11000	5700	16000	6900	12000	10000
Lead	MG/KG	7439-92-1	68 - 68	1.7 - 22	- - -	6.92	14	4.8	5.5	4.3	7.5	4.4	7.2	4.5	6.2	8.2
Magnesium	MG/KG	7439-95-4	68 - 68	820 - 7300	- - -	2642	6400	3200	2500	2500	3200	1700	7300	2100	3800	3100
Manganese	MG/KG	7439-96-5	68 - 68	31 - 370	- - -	128.24	310	150	160 J+	120	170	77	190	110	140	150
Mercury	MG/KG	7439-97-6	30 - 68	0.0086 - 0.19	0.019 - 0.21	0.04	0.022 U	0.0086 J	0.022 U	0.021 U	0.016 J	0.012 J	0.022 U	0.019 U	0.019 U	0.022 J
Nickel	MG/KG	7440-02-0	68 - 68	2.5 - 40	- - -	11.55	40	13	8.9	9.8	18	9.5	33	9	19	10
Silver	MG/KG	7440-22-4	10 - 68	0.13 - 1.2	0.61 - 0.82	0.39	0.66 U	0.62 U	0.66 U	0.68 U	0.63 U	0.71 U	0.7 U	0.66 U	0.61 U	0.75 U
Sodium	MG/KG	7440-23-5	60 - 68	46 - 470	150 - 180	144.91	170	130 J	240	370	200	63 J	160	86 J	470	170 U
Thallium	MG/KG	7440-28-0	0 - 68	-	1.1 - 8.2		6.6 U	6.2 U	6.6 U	6.8 U	6.3 U	7.1 U	7 U	6.6 U	6.1 U	7.5 U
Tin	MG/KG	7440-31-5	46 - 68	0.5 - 36	2.1 - 2.7	4.07	0.84 J	2.1 U	0.57 J	0.5 J	0.65 J	2.4 U	0.59 J	0.52 J	0.96 J	2.5 U
Antimony	MG/KG	7440-36-0	17 - 68	0.45 - 1.2	0.57 - 83	5.97	1.2 J	15 U	0.65 J-	0.5 J	0.72 J	18 U	1.1 J	16 U	0.57 J	19 U
Arsenic	MG/KG	7440-38-2	68 - 68	0.76 - 33	- - -	8.47	29	5	3.6	2.4	17	6.3	16	2.9	3.2	7.6
Barium	MG/KG	7440-39-3	68 - 68	6.6 - 89	- - -	33.80	55	16	26	25	54	16	47	23	45	49 J
Beryllium	MG/KG	7440-41-7	68 - 68	0.08 - 0.67	- - -	0.32	0.62	0.32	0.4	0.38	0.43	0.24	0.34	0.34	0.52	0.3
Cadmium	MG/KG	7440-43-9	44 - 68	0.035 - 9.3	0.21 - 0.26	0.40	0.22 U	0.051 J	0.22 U	0.23 U	0.035 J	0.16 J	0.036 J	0.2 J	0.14 J	0.13 J
Chromium	MG/KG	7440-47-3	68 - 68	5.3 - 1300	- - -	97.51	44	120	83 J-	72	26	40	40	18	31	63
Cobalt	MG/KG	7440-48-4	68 - 68	0.79 - 13	- - -	4.03	13	3.2	3.2	3.8	5.8	2.8	7.4	2.9	6.6	3.7
Copper	MG/KG	7440-50-8	68 - 68	0.75 - 27	- - -	8.89	22	12	11	9.6	11	5.2	15	10	17	7.7
Vanadium	MG/KG	7440-62-2	68 - 68	5.2 - 40	- - -	15.83	33	15	17 J	15	18	9.9	28	17	36	16
Zinc	MG/KG	7440-66-6	68 - 68	6.4 - 78	- - -	22.89	43	16	21	15	22	17	35	23	37	21
Calcium	MG/KG	7440-70-2	68 - 68	550 - 110000	- - -	10629	3700	7000	2400	3300	7900	2400	2300	3700	2900	11000
Selenium	MG/KG	7782-49-2	10 - 68	0.5 - 1.1	0.57 - 5.5	1.78	4.4 U	4.1 U	4.4 U	4.5 U	4.2 U	4.7 U	4.6 U	4.4 U	4.1 U	5 U
Potassium	MG/KG	9/7/7440	68 - 68	340 - 4300	- - -	1220	2700	750	1400	1300	1700	780	2800	1100	2400	1000
Phthalates																
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	-	0.11 - 0.12											
Semi-Volatile Organic Compounds																
4-Nitroaniline	MG/KG	100-01-6	0 - 68	-	0.18 - 5.4		0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.2 U
4-Nitrophenol	MG/KG	100-02-7	0 - 68	-	0.18 - 5.4		0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.2 U
Benzyl alcohol	MG/KG	100-51-6	1 - 68	0.059 - 0.059	0.034 - 1.1	0.044	0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Benzaldehyde	MG/KG	100-52-7	7 - 68	0.0067 - 0.23	0.036 - 2.1	0.080	0.073 R	0.072 R	0.069 R	0.072 R	0.072 R	0.077 R	0.074 R	0.071 R	0.07 R	0.08 R
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 68	0.19 - 0.19	0.034 - 1.1	0.041	0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.044	0.019										
Azobenzene	MG/KG	103-33-3	0 - 68	-	0.036 - 7.5		0.36 U	0.36 U	0.35 U	0.36 U	0.36 U	0.38 U	0.36 U	0.34 U	0.33 U	0.39 U
Caprolactam	MG/KG	105-60-2	0 - 68	-	0.036 - 5.4		0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.2 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 68	0.0039 - 0.012	0.034 - 1.1	0.040	0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
4-Chloroaniline	MG/KG	106-47-8	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 68	-	0.007 - 0.21		0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Phenol	MG/KG	108-95-2	13 - 68	0.011 - 8.8	0.034 - 1.1	0.182	0.036 U	0.035 U	0.034 U	0.036 U	0.013 J	0.038 U	0.036 U	0.035 U	0.034 U	0.08
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 68	-	0.007 - 0.21		0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	54 - 68	0.043 - 420	0.34 - 0.41	13.127	0.5	2.4	0.34 U	0.36 U	0.5	0.072 J	0.057 J	2.9	0.34 U	0.94
Di-n-octylphthalate	MG/KG	117-84-0	2 - 68	0.023 - 0.061	0.034 - 1.1	0.041	0.036 U	0.023 J	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.061
Hexachlorobenzene	MG/KG	118-74-1	0 - 68	-	0.007 - 0.21		0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Diphenylmethanone	MG/KG	119-61-9	0 - 10	-	0.036 - 0.044											
Anthracene	MG/KG	120-12-7	13 - 68	0.0021 - 0.06	0.007 - 0.21	0.010	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0026 J	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	12 - 68	0.0017 - 0.068	0.034 - 1.1	0.037	0.0017 J	0.035 U	0.034 U	0.036 U	0.0022 J	0.038 U	0.036 U	0.0075 J	0.034 U	0.0039 J
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 68	-	0.007 - 0.21		0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-707 OC-SB-707-2_0/4_0-XXX 11/7/2019 2- 4	SB-707 OC-SB-707-4_0/6_0-XXX 11/7/2019 4- 6	SB-707 OC-SB-707-6_0/8_0-XXX 11/7/2019 6- 8	SB-707 OC-SB-707-8_0/10-XXX 11/7/2019 8- 10	SB-708 OC-SB-708-0_0/2_0-XXX 11/4/2019 0- 2	SB-708 OC-SB-708-2_0/4_0-XXX 11/4/2019 2- 4	SB-708 OC-SB-708-4_0/6_0-XXX 11/4/2019 4- 6	SB-708 OC-SB-708-6_0/8_0-XXX 11/4/2019 6- 8	SB-708 OC-SB-708-8_0/10-XXX 11/4/2019 8- 10	SB-709 OC-SB-709-0_0/2_0-XXX 11/6/2019 0- 2
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.039	0.018										
Pyrene	MG/KG	129-00-0	38 - 68	0.0017 - 0.15	0.007 - 0.21	0.018	0.0017 J	0.0072 U	0.0069 U	0.0072 U	0.01	0.0029 J	0.0074 U	0.0041 J	0.007 U	0.014
Dimethylphthalate	MG/KG	131-11-3	1 - 68	0.002 - 0.002	0.034 - 1.1	0.040	0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Dibenzofuran	MG/KG	132-64-9	3 - 68	0.0088 - 0.029	0.034 - 1.1	0.037	0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	-	0.036 - 0.044											
Atrazine	MG/KG	1912-24-9	0 - 68	-	0.036 - 2.1		0.073 U	0.072 U	0.069 U	0.072 U	0.072 U	0.077 U	0.074 U	0.071 U	0.07 U	0.08 U
Benzo(ghi)perylene	MG/KG	191-24-2	22 - 68	0.0018 - 0.056	0.007 - 0.21	0.012	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0067 J	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.0074 J
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	21 - 68	0.0017 - 0.038	0.007 - 0.21	0.012	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0059 J	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.0063 J
Benzo(b)fluoranthene	MG/KG	205-99-2	29 - 68	0.0021 - 0.068	0.007 - 0.21	0.014	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.017	0.0077 U	0.0074 U	0.0021 J	0.007 U	0.012
Fluoranthene	MG/KG	206-44-0	40 - 68	0.0028 - 0.16	0.007 - 0.21	0.018	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0098	0.0028 J	0.0074 U	0.0031 J	0.007 U	0.014
Benzo(k)fluoranthene	MG/KG	207-08-9	15 - 68	0.003 - 0.032	0.007 - 0.21	0.011	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0045 J	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.0052 J
Acenaphthylene	MG/KG	208-96-8	7 - 68	0.0016 - 0.0063	0.007 - 0.21	0.010	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0016 J	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Chrysene	MG/KG	218-01-9	31 - 68	0.0021 - 0.075	0.007 - 0.21	0.014	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.016	0.0021 J	0.0074 U	0.0027 J	0.007 U	0.012
Benzo(a)pyrene	MG/KG	50-32-8	23 - 68	0.0026 - 0.067	0.007 - 0.21	0.013	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0085	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.0089
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 68	-	0.036 - 11		0.36 U	0.35 U	0.34 U	0.36 U	0.36 U	0.38 U	0.36 U	0.35 U	0.34 U	0.39 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 68	-	0.18 - 5.4		0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.2 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	9 - 68	0.0021 - 0.012	0.007 - 0.21	0.010	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0027 J	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.0021 J
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Benzo(a)anthracene	MG/KG	56-55-3	31 - 68	0.0014 - 0.072	0.007 - 0.21	0.013	0.0014 J	0.0072 U	0.0069 U	0.0072 U	0.01	0.0017 J	0.0074 U	0.0016 J	0.007 U	0.0094
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 68	-	0.007 - 0.21		0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Aniline	MG/KG	62-53-3	1 - 68	0.017 - 0.017	0.034 - 1.1	0.041	0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.017 J	0.034 U	0.039 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 68	-	0.006 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Benzoic Acid	MG/KG	65-85-0	0 - 68	-	0.18 - 5.4		0.19 U	0.18 U	0.18 R	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.2 U
Hexachloroethane	MG/KG	67-72-1	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	2 - 68	0.0064 - 0.031	0.034 - 1.1	0.040	0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Isophorone	MG/KG	78-59-1	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Acenaphthene	MG/KG	83-32-9	3 - 68	0.0055 - 0.017	0.007 - 0.21	0.011	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Diethylphthalate	MG/KG	84-66-2	2 - 68	0.02 - 0.025	0.034 - 1.1	0.041	0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.02 J	0.025 J	0.035 U	0.034 U	0.039 U
Di-n-butylphthalate	MG/KG	84-74-2	5 - 68	0.018 - 2.1	0.034 - 1.1	0.069	0.036 U	0.035 U	0.034 U	0.036 U	0.018 J	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Phenanthrene	MG/KG	85-01-8	43 - 68	0.0022 - 0.66	0.007 - 0.21	0.025	0.0033 J	0.0026 J	0.0025 J	0.0072 U	0.0073	0.0029 J	0.0023 J	0.0023 J	0.007 U	0.0083
Phthalic anhydride	MG/KG	85-44-9	0 - 58	-	10 - 230		11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ	10 UJ	10 UJ	12 UJ
Butylbenzylphthalate	MG/KG	85-68-7	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	38 - 69	0.012 - 54	0.034 - 0.2	1.366	0.018 J	0.035 U	0.034 U	0.036 U	0.1	0.038 U	0.036 U	0.28	0.034 U	0.049
Fluorene	MG/KG	86-73-7	7 - 68	0.0019 - 0.022	0.007 - 0.21	0.011	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Carbazole	MG/KG	86-74-8	10 - 68	0.0017 - 0.055	0.007 - 0.21	0.010	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0019 J	0.0077 U	0.0074 U	0.0022 J	0.007 U	0.008 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.007 - 0.21		0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Pentachlorophenol	MG/KG	87-86-5	0 - 68	-	0.036 - 5.4		0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.2 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
2-Nitroaniline	MG/KG	88-74-4	0 - 68	-	0.18 - 5.4		0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.2 U
2-Nitrophenol	MG/KG	88-75-5	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
1-Methylnaphthalene	MG/KG	90-12-0	6 - 68	0.002 - 0.06	0.007 - 0.072	0.009	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
Naphthalene	MG/KG	91-20-3	24 - 68	0.0014 - 0.54	0.007 - 0.21	0.022	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.005 J	0.0019 J	0.0074 U	0.0071 U	0.007 U	0.005 J
2-Methylnaphthalene	MG/KG	91-57-6	7 - 68	0.0019 - 0.1	0.007 - 0.19	0.011	0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 68	-	0.007 - 0.21		0.0073 U	0.0072 U	0.0069 U	0.0072 U	0.0072 U	0.0077 U	0.0074 U	0.0071 U	0.007 U	0.008 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Biphenyl	MG/KG	92-52-4	21 - 68	0.0017 - 14	0.034 - 1.1	0.312	0.036 U	0.035 U	0.034 U	0.036 U	0.0035 J	0.038 U	0.036 U	0.035 U	0.034 U	0.0044 J
2-Methylphenol	MG/KG	95-48-7	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
2-Chlorophenol	MG/KG	95-57-8	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 68	-	0.034 - 1.1		0.036 U	0.035 U	0.034 U	0.036 U	0.036 U	0.038 U	0.036 U	0.035 U	0.034 U	0.039 U
Acetophenone	MG/KG	98-86-2	6 - 68	0.0034 - 0.0083	0.036 - 2.1	0.075	0.073 U	0.072 U	0.069 U	0.072 U	0.0034 J	0.077 U	0.074 U	0.071 U	0.07 U	0.0041 J
Nitrobenzene	MG/KG	98-95-3	0 - 68	-	0.036 - 2.1		0.073 U	0.072 U	0.069 U	0.072 U	0.072 U	0.076 U	0.073 U	0.071 U	0.069 U	0.079 U
3-Nitroaniline	MG/KG	99-09-2	0 - 68	-	0.18 - 5.4		0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.2 U
Volatile Organic Compounds																
Ethylbenzene	MG/KG	100-41-4	7 - 68	0.00027 - 0.37	0.002 - 1.9	0.030	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.00042 J
Styrene	MG/KG	100-42-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-707 OC-SB-707-2_0/4_0-XXX 11/7/2019 2- 4	SB-707 OC-SB-707-4_0/6_0-XXX 11/7/2019 4- 6	SB-707 OC-SB-707-6_0/8_0-XXX 11/7/2019 6- 8	SB-707 OC-SB-707-8_0/10-XXX 11/7/2019 8- 10	SB-708 OC-SB-708-0_0/2_0-XXX 11/4/2019 0- 2	SB-708 OC-SB-708-2_0/4_0-XXX 11/4/2019 2- 4	SB-708 OC-SB-708-4_0/6_0-XXX 11/4/2019 4- 6	SB-708 OC-SB-708-6_0/8_0-XXX 11/4/2019 6- 8	SB-708 OC-SB-708-8_0/10-XXX 11/4/2019 8- 10	SB-709 OC-SB-709-0_0/2_0-XXX 11/6/2019 0- 2
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Propylbenzene	MG/KG	103-65-1	3 - 68	0.00049 - 0.007	0.002 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
n-Butylbenzene	MG/KG	104-51-8	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 UJ	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	36 - 68	0.00076 - 8	0.004 - 1.2	0.179	0.0063	0.001 J	0.0038 U	0.0039 U	0.0027 J	0.006 U	0.0057	0.0091	0.0043 U	0.0044 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	27 - 68	0.00056 - 6.3	0.004 - 1.2	0.143	0.0035 J	0.0042 U	0.0038 U	0.0039 U	0.00088 J	0.006 U	0.00076 J	0.0021 J	0.0043 U	0.0044 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 68	-	0.018 - 9.3		0.02 U	0.021 U	0.019 UJ	0.019 U	0.032 U	0.03 U	0.022 U	0.019 U	0.0043 U	0.022 U
Isopropyl ether	MG/KG	108-20-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	6 - 68	0.00037 - 0.0014	0.002 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.00063 J	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Bromobenzene	MG/KG	108-86-1	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Toluene	MG/KG	108-88-3	10 - 68	0.00029 - 0.0042	0.002 - 1.9	0.032	0.00041 J	0.0042 U	0.0038 U	0.0039 U	0.00061 J	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Chlorobenzene	MG/KG	108-90-7	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 68	-	0.023 - 19		0.039 U	0.042 U	0.038 UJ	0.039 U	0.064 U	0.06 U	0.044 U	0.039 U	0.0043 U	0.044 U
Cyclohexane	MG/KG	110-82-7	0 - 68	-	0.018 - 9.3		0.02 U	0.021 U	0.019 U	0.019 U	0.032 U	0.03 U	0.022 U	0.019 U	0.0043 U	0.022 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	10 - 68	0.00036 - 0.0025	0.002 - 1.9	0.032	0.0014 J	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.00037 J	0.0044 U	0.00043 J	0.0043 U	0.0044 U
1,4-Dioxane	MG/KG	123-91-1	0 - 68	-	0.18 - 93		0.2 U	0.21 U	0.19 UJ	0.19 U	0.32 U	0.3 U	0.22 U	0.19 U	0.0043 U	0.22 U
Dibromochloromethane	MG/KG	124-48-1	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Tetrachloroethene	MG/KG	127-18-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Xylenes, Total	MG/KG	1330-20-7	7 - 68	0.00075 - 0.0026	0.004 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0014 J
sec-Butylbenzene	MG/KG	135-98-8	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 UJ	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Xylenes (m&p)	MG/KG	179601-23-1	7 - 68	0.00075 - 0.0014	0.004 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0014 J
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 68	0.00032 - 0.0004	0.002 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
2-Hexanone	MG/KG	591-78-6	0 - 68	-	0.018 - 9.3		0.02 U	0.021 U	0.019 UJ	0.019 U	0.032 U	0.03 U	0.022 U	0.019 U	0.0043 U	0.022 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Diethyl ether	MG/KG	60-29-7	2 - 68	0.0028 - 0.0034	0.002 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Acetone	MG/KG	67-64-1	38 - 68	0.0042 - 0.099	0.19 - 93	1.580	0.2 U	0.21 U	0.19 UJ	0.19 U	0.02 J	0.041 J	0.012 J	0.011 J	0.0043 U	0.0058 J
Chloroform	MG/KG	67-66-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Benzene	MG/KG	71-43-2	5 - 68	0.0002 - 0.0008	0.002 - 1.9	0.032	0.0002 J	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Bromomethane	MG/KG	74-83-9	0 - 68	-	0.004 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Chloromethane	MG/KG	74-87-3	0 - 68	-	0.004 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Dibromomethane	MG/KG	74-95-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Bromochloromethane	MG/KG	74-97-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Chloroethane	MG/KG	75-00-3	0 - 68	-	0.004 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Vinyl chloride	MG/KG	75-01-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Methylene chloride	MG/KG	75-09-2	0 - 68	-	0.004 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Carbon disulfide	MG/KG	75-15-0	10 - 68	0.0024 - 0.0066	0.002 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0039 J	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Bromoform	MG/KG	75-25-2	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Bromodichloromethane	MG/KG	75-27-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,1-Dichloroethane	MG/KG	75-34-3	2 - 68	0.0007 - 0.0008	0.002 - 1.9	0.032	0.00083 J	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 68	-	0.004 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 68	-	0.004 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 68	-	0.004 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
2-Butanone	MG/KG	78-93-3	26 - 68	0.0044 - 0.56	0.018 - 9.3	0.173	0.021 J+	0.021 U	0.019 U	0.019 U	0.032 U	0.011 J+	0.022 U	0.019 U	0.0043 U	0.022 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Trichloroethene	MG/KG	79-01-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 68	0.0063 - 0.33	0.037 - 19	0.255	0.039 U	0.042 U	0.038 UJ	0.039 U	0.064 U	0.06 U	0.044 U	0.039 U	0.0043 U	0.044 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 UJ	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-707 OC-SB-707-2_0/4_0-XXX 11/7/2019 2- 4	SB-707 OC-SB-707-4_0/6_0-XXX 11/7/2019 4- 6	SB-707 OC-SB-707-6_0/8_0-XXX 11/7/2019 6- 8	SB-707 OC-SB-707-8_0/10-XXX 11/7/2019 8- 10	SB-708 OC-SB-708-0_0/2_0-XXX 11/4/2019 0- 2	SB-708 OC-SB-708-2_0/4_0-XXX 11/4/2019 2- 4	SB-708 OC-SB-708-4_0/6_0-XXX 11/4/2019 4- 6	SB-708 OC-SB-708-6_0/8_0-XXX 11/4/2019 6- 8	SB-708 OC-SB-708-8_0/10-XXX 11/4/2019 8- 10	SB-709 OC-SB-709-0_0/2_0-XXX 11/6/2019 0- 2
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 UJ	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 UJ	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Naphthalene	MG/KG	91-20-3	8 - 68	0.0009 - 0.18	0.018 - 9.3	0.128	0.02 U	0.021 U	0.019 UJ	0.019 U	0.0011 J	0.03 U	0.022 U	0.019 U	0.0043 U	0.022 U
Xylene, o	MG/KG	95-47-6	2 - 68	0.00075 - 0.0016	0.002 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	4 - 68	0.0027 - 0.016	0.002 - 1.9	0.032	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 68	-	0.018 - 9.3		0.02 U	0.021 U	0.019 UJ	0.019 U	0.032 U	0.03 U	0.022 U	0.019 U	0.0043 U	0.022 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 UJ	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Isopropylbenzene	MG/KG	98-82-8	4 - 68	0.0012 - 0.2	0.002 - 1.9	0.028	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 68	-	0.002 - 1.9		0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0064 U	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
4-iso-Propyltoluene	MG/KG	99-87-6	8 - 68	0.00041 - 0.42	0.002 - 1.9	0.031	0.0039 U	0.0042 U	0.0038 U	0.0039 U	0.0013 J	0.006 U	0.0044 U	0.0039 U	0.0043 U	0.0044 U
Hydrazine/aldehydes																
Hydrazine	MG/KG	302-01-2	31 - 63	0.00062 - 0.086	0.002 - 0.007	0.005	0.002 J	0.0093	0.0027 J	0.0017 J	0.0064	0.0059 U	0.0055 U	0.0055 U	0.0053 UJ	0.0061 U
Formaldehyde	MG/KG	50-00-0	26 - 63	0.096 - 11	0.11 - 2.6	1.612	2.2 UJ	2.2 UJ	1.3 J	1.5 J	2.2 UJ	2.4 UJ	2.2 UJ	2.1 UJ	2.1 UJ	2.4 U
UDMH	MG/KG	57-14-7	0 - 63	-	0.005 - 0.007		0.0058 U	0.0054 U	0.0053 U	0.0055 U	0.0062 U	0.0059 U	0.0055 U	0.0055 U	0.0053 U	0.0061 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 63	-	0.005 - 0.007		0.0058 U	0.0054 U	0.0053 U	0.0055 U	0.0062 UJ	0.0059 UJ	0.0055 UJ	0.0055 UJ	0.0053 UJ	0.0061 UJ
Acetaldehyde	MG/KG	75-07-0	0 - 5	-	0.23 - 0.24											

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-709 OC-SB-709-2_0/4_0-XXX 11/6/2019 2- 4	SB-709 OC-SB-709-4_0/6_0-XXX 11/6/2019 4- 6	SB-709 OC-SB-709-6_0/8_0-XXX 11/6/2019 6- 8	SB-709 OC-SB-709-8_0/10-XXX 11/6/2019 8- 10	SB-710 OC-SB-710-2_0/4_0-XXX 11/4/2019 2- 4	SB-710 OC-SB-710-4_0/6_0-XXX 11/4/2019 4- 6	SB-710 OC-SB-710-6_0/8_0-XXX 11/4/2019 6- 8	SB-710 OC-SB-710-8_0/10-XXX 11/4/2019 8- 10	SB-711 OC-SB-711-0_0/2_0-XXX 11/12/2019 0- 2	SB-711 OC-SB-711-2_0/4_0-XXX 11/12/2019 2- 4
Dimethylformamide																
Dimethylformamide	MG/KG	68-12-2	0 - 63	-	0.14 - 0.84		0.21 U	0.2 U	0.19 U	0.18 U	0.23 U	0.21 U	0.2 U	0.22 U	0.2 U	0.19 U
Inorganics																
Sulfate	MG/KG	14808-79-8	58 - 58	12 - 18000	- - -	2914	12000	63	150	110	3900 J	6400 J	170 J	71 J	1800 J	2400 J
Chloride	MG/KG	16887-00-6	18 - 58	4.1 - 19	10 - 13	6.39	11 U	12 U	17	12 U	19 J	6.9 J	11 UJ	11 UJ	12 UJ	11 UJ
Ammonia	MG/KG	7664-41-7	55 - 58	3.5 - 58	6.6 - 9.9	15.25	7.6	15	3.5 J	6.7 J	15	12	18	14	14	8.8
Sulfate	MG/KG	14808-79-8	10 - 10	57 - 13000	- -	3460										
Chloride	MG/KG	16887-00-6	1 - 10	44 - 44	15 - 25	13.35										
Total Organic Carbon	MG/KG	HLA0011	1 - 1	9400 - 9400	- - -	9400										
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37										
Metals & Inorganics																
Chromium, Hexavalent	MG/KG	18540-29-9	54 - 58	0.18 - 20.8	0.44 - 0.49	2.59	1.2	1.7	8	0.74	2	1.2	0.79	0.61	5.1	0.74
Aluminum	MG/KG	7429-90-5	68 - 68	2100 - 15000	- - -	7328	5200	7500	5000	10000	7300	5800	2100	6500	8200	8100 J
Iron	MG/KG	7439-89-6	68 - 68	2700 - 23000	- - -	9543	5900	8100	5300	13000	9900	8700	3200	5300	9300	11000
Lead	MG/KG	7439-92-1	68 - 68	1.7 - 22	- - -	6.92	5	6.2	5.7	7.1	7.4	4.4	1.9	4.8	8.1	13
Magnesium	MG/KG	7439-95-4	68 - 68	820 - 7300	- - -	2642	1400	2600	1300	3300 J-	3000	3000	840	1900	3400	2800
Manganese	MG/KG	7439-96-5	68 - 68	31 - 370	- - -	128.24	53	100	45	130 J-	170	130	47	69	160	140 J+
Mercury	MG/KG	7439-97-6	30 - 68	0.0086 - 0.19	0.019 - 0.21	0.04	0.042	0.041	0.014 J	0.024 U	0.021 J	0.01 J	0.022 U	0.02 U	0.035	0.19
Nickel	MG/KG	7440-02-0	68 - 68	2.5 - 40	- - -	11.55	7.4	14	7.1	13	14	14	2.5 J	10	9.2	16
Silver	MG/KG	7440-22-4	10 - 68	0.13 - 1.2	0.61 - 0.82	0.39	0.7 U	0.67 U	0.73 U	0.73 U	0.78 U	0.7 U	0.67 U	0.67 U	0.76 U	0.65 U
Sodium	MG/KG	7440-23-5	60 - 68	46 - 470	150 - 180	144.91	160 U	160 U	170 U	150 J	250	130 J	81 J	110 J	140 J	180 J
Thallium	MG/KG	7440-28-0	0 - 68	-	1.1 - 8.2		7 U	6.7 U	7.3 U	7.3 U	7.8 U	7 U	6.7 U	6.7 U	7.6 U	6.5 U
Tin	MG/KG	7440-31-5	46 - 68	0.5 - 36	2.1 - 2.7	4.07	0.5 J	0.62 J	2.4 U	0.77 J	0.74 J	0.51 J	2.2 U	2.2 U	0.76 J	0.86 J
Antimony	MG/KG	7440-36-0	17 - 68	0.45 - 1.2	0.57 - 83	5.97	18 U	17 U	18 U	18 U	19 U	0.56 J	17 U	17 U	0.64 J	0.45 J-
Arsenic	MG/KG	7440-38-2	68 - 68	0.76 - 33	- - -	8.47	5.6	6	3.8	7	10	9.2	2.1 J	2 J	8.1	12
Barium	MG/KG	7440-39-3	68 - 68	6.6 - 89	- - -	33.80	13 J	21 J	12 J	49 J-	43	24	14	14	73	32
Beryllium	MG/KG	7440-41-7	68 - 68	0.08 - 0.67	- - -	0.32	0.18 J	0.25 J	0.22 J	0.52	0.32	0.21 J	0.08 J	0.27	0.34	0.36
Cadmium	MG/KG	7440-43-9	44 - 68	0.035 - 9.3	0.21 - 0.26	0.40	0.6 J	0.29 J	0.24 U	0.24 U	0.1 J	0.05 J	0.04 J	1.9	0.34	2.5
Chromium	MG/KG	7440-47-3	68 - 68	5.3 - 1300	- - -	97.51	29	39	420	21	140	41	10	12	95	63 J+
Cobalt	MG/KG	7440-48-4	68 - 68	0.79 - 13	- - -	4.03	2.6	4.6	2.1	6.6	4.6	3.7	0.79	3.2	3.9	5.4
Copper	MG/KG	7440-50-8	68 - 68	0.75 - 27	- - -	8.89	4.8	11	5	11	14	7.5	3.8	8.6	8.6	12
Vanadium	MG/KG	7440-62-2	68 - 68	5.2 - 40	- - -	15.83	10	16	8.2	23	18	13	5.2	9.9	16	19
Zinc	MG/KG	7440-66-6	68 - 68	6.4 - 78	- - -	22.89	18	20	17	28 J-	28	19	6.4	21	25	78 J+
Calcium	MG/KG	7440-70-2	68 - 68	550 - 110000	- - -	10629	4600	4200	550	2200	11000	2800	1100	950	30000	4100 J-
Selenium	MG/KG	7782-49-2	10 - 68	0.5 - 1.1	0.57 - 5.5	1.78	4.7 U	4.5 U	4.9 U	4.9 U	5.2 U	4.7 U	4.5 U	0.57 J	1.1 J	0.58 J
Potassium	MG/KG	9/7/7440	68 - 68	340 - 4300	- - -	1220	540	1000	580	1600	1700	1200	650	810	1200	1500
Phthalates																
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	-	0.11 - 0.12											
Semi-Volatile Organic Compounds																
4-Nitroaniline	MG/KG	100-01-6	0 - 68	-	0.18 - 5.4		0.58 U	0.2 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.2 U	0.37 U
4-Nitrophenol	MG/KG	100-02-7	0 - 68	-	0.18 - 5.4		0.58 U	0.2 U	0.19 U	0.2 U	0.22 UJ	0.19 UJ	0.19 UJ	0.19 UJ	0.2 U	0.37 U
Benzyl alcohol	MG/KG	100-51-6	1 - 68	0.059 - 0.059	0.034 - 1.1	0.044	0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Benzaldehyde	MG/KG	100-52-7	7 - 68	0.0067 - 0.23	0.036 - 2.1	0.080	0.23 R	0.077 R	0.077 R	0.078 R	0.085 R	0.075 R	0.075 R	0.073 R	0.08 R	0.15 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 68	0.19 - 0.19	0.034 - 1.1	0.041	0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.044	0.019										
Azobenzene	MG/KG	103-33-3	0 - 68	-	0.036 - 7.5		0.38 U	0.38 U	0.38 U	0.38 U	0.42 U	0.37 U	0.37 U	0.35 U	0.4 U	1.8 U
Caprolactam	MG/KG	105-60-2	0 - 68	-	0.036 - 5.4		0.58 U	0.2 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.2 U	0.37 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 68	0.0039 - 0.012	0.034 - 1.1	0.040	0.11 U	0.0039 J	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.012 J
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
4-Chloroaniline	MG/KG	106-47-8	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 68	-	0.007 - 0.21		0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
Phenol	MG/KG	108-95-2	13 - 68	0.011 - 8.8	0.034 - 1.1	0.182	0.053 J	0.34	0.038 U	0.039 U	0.042 U	0.011 J	0.037 U	0.036 U	0.04 U	8.8
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 68	-	0.007 - 0.21		0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	54 - 68	0.043 - 420	0.34 - 0.41	13.127	6.3	6.9	6.7	0.39 U	0.3 J	1	0.37 U	0.12 J	4.9	19
Di-n-octylphthalate	MG/KG	117-84-0	2 - 68	0.023 - 0.061	0.034 - 1.1	0.041	0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 68	-	0.007 - 0.21		0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
Diphenylmethanone	MG/KG	119-61-9	0 - 10	-	0.036 - 0.044											
Anthracene	MG/KG	120-12-7	13 - 68	0.0021 - 0.06	0.007 - 0.21	0.010	0.023 U	0.0023 J	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.0063 J	0.0043 J
1,2,4-Trichlorobenzene	MG/KG	120-82-1	12 - 68	0.0017 - 0.068	0.034 - 1.1	0.037	0.023 J	0.014 J	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.0028 J	0.071 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 68	-	0.007 - 0.21		0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-709 OC-SB-709-2_0/4_0-XXX 11/6/2019 2- 4	SB-709 OC-SB-709-4_0/6_0-XXX 11/6/2019 4- 6	SB-709 OC-SB-709-6_0/8_0-XXX 11/6/2019 6- 8	SB-709 OC-SB-709-8_0/10-XXX 11/6/2019 8- 10	SB-710 OC-SB-710-2_0/4_0-XXX 11/4/2019 2- 4	SB-710 OC-SB-710-4_0/6_0-XXX 11/4/2019 4- 6	SB-710 OC-SB-710-6_0/8_0-XXX 11/4/2019 6- 8	SB-710 OC-SB-710-8_0/10-XXX 11/4/2019 8- 10	SB-711 OC-SB-711-0_0/2_0-XXX 11/12/2019 0- 2	SB-711 OC-SB-711-2_0/4_0-XXX 11/12/2019 2- 4
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.039	0.018										
Pyrene	MG/KG	129-00-0	38 - 68	0.0017 - 0.15	0.007 - 0.21	0.018	0.034	0.016	0.0018 J	0.0078 U	0.0066 J	0.0089	0.0075 U	0.0073 U	0.04	0.02
Dimethylphthalate	MG/KG	131-11-3	1 - 68	0.002 - 0.002	0.034 - 1.1	0.040	0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Dibenzofuran	MG/KG	132-64-9	3 - 68	0.0088 - 0.029	0.034 - 1.1	0.037	0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	-	0.036 - 0.044											
Atrazine	MG/KG	1912-24-9	0 - 68	-	0.036 - 2.1		0.23 U	0.077 U	0.077 U	0.078 U	0.085 U	0.075 U	0.075 U	0.073 U	0.08 U	0.15 U
Benzo(ghi)perylene	MG/KG	191-24-2	22 - 68	0.0018 - 0.056	0.007 - 0.21	0.012	0.013 J	0.0065 J	0.0077 U	0.0078 U	0.0041 J	0.0032 J	0.0075 U	0.0073 U	0.011	0.015 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	21 - 68	0.0017 - 0.038	0.007 - 0.21	0.012	0.013 J	0.0065 J	0.0077 U	0.0078 U	0.0038 J	0.0029 J	0.0075 U	0.0073 U	0.011	0.015 U
Benzo(b)fluoranthene	MG/KG	205-99-2	29 - 68	0.0021 - 0.068	0.007 - 0.21	0.014	0.028	0.013	0.0077 U	0.0078 U	0.0063 J	0.0058 J	0.0075 U	0.0073 U	0.025	0.019
Fluoranthene	MG/KG	206-44-0	40 - 68	0.0028 - 0.16	0.007 - 0.21	0.018	0.035	0.016	0.0077 U	0.0078 U	0.0067 J	0.01	0.0075 U	0.0073 U	0.046	0.023
Benzo(k)fluoranthene	MG/KG	207-08-9	15 - 68	0.003 - 0.032	0.007 - 0.21	0.011	0.011 J	0.0043 J	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.0088	0.0083 J
Acenaphthylene	MG/KG	208-96-8	7 - 68	0.0016 - 0.0063	0.007 - 0.21	0.010	0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.0018 J	0.015 U
Chrysene	MG/KG	218-01-9	31 - 68	0.0021 - 0.075	0.007 - 0.21	0.014	0.027	0.012	0.0077 U	0.0078 U	0.0059 J	0.0058 J	0.0075 U	0.0073 U	0.027	0.02
Benzo(a)pyrene	MG/KG	50-32-8	23 - 68	0.0026 - 0.067	0.007 - 0.21	0.013	0.022 J	0.0075 J	0.0077 U	0.0078 U	0.0044 J	0.0047 J	0.0075 U	0.0073 U	0.017	0.015 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 68	-	0.036 - 11		1.1 U	0.38 U	0.38 U	0.39 U	0.42 U	0.37 U	0.37 U	0.36 U	0.4 UJ	0.71 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 68	-	0.18 - 5.4		0.58 U	0.2 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.2 U	0.37 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	9 - 68	0.0021 - 0.012	0.007 - 0.21	0.010	0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Benzo(a)anthracene	MG/KG	56-55-3	31 - 68	0.0014 - 0.072	0.007 - 0.21	0.013	0.026	0.0085	0.0077 U	0.0078 U	0.0038 J	0.0057 J	0.0075 U	0.0073 U	0.022	0.0099 J
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 68	-	0.007 - 0.21		0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
Aniline	MG/KG	62-53-3	1 - 68	0.017 - 0.017	0.034 - 1.1	0.041	0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 68	-	0.006 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Benzoic Acid	MG/KG	65-85-0	0 - 68	-	0.18 - 5.4		0.58 U	0.2 U	0.19 U	0.2 R	0.22 U	0.19 U	0.19 U	0.19 U	0.2 R	0.37 U
Hexachloroethane	MG/KG	67-72-1	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	2 - 68	0.0064 - 0.031	0.034 - 1.1	0.040	0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Isophorone	MG/KG	78-59-1	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Acenaphthene	MG/KG	83-32-9	3 - 68	0.0055 - 0.017	0.007 - 0.21	0.011	0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
Diethylphthalate	MG/KG	84-66-2	2 - 68	0.02 - 0.025	0.034 - 1.1	0.041	0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Di-n-butylphthalate	MG/KG	84-74-2	5 - 68	0.018 - 2.1	0.034 - 1.1	0.069	0.072 J	0.029 J	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.021 J	0.071 U
Phenanthrene	MG/KG	85-01-8	43 - 68	0.0022 - 0.66	0.007 - 0.21	0.025	0.015 J	0.0093	0.0025 J	0.0036 J	0.0039 J	0.0079	0.0075 U	0.0022 J	0.021	0.015
Phthalic anhydride	MG/KG	85-44-9	0 - 58	-	10 - 230		11 UJ	12 UJ	12 UJ	12 UJ	13 UJ	11 UJ	11 UJ	11 UJ	12 UJ	54 UJ
Butylbenzylphthalate	MG/KG	85-68-7	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	38 - 69	0.012 - 54	0.034 - 0.2	1.366	1.6	0.45	0.027 J	0.039 U	0.035 J	0.062	0.037 U	0.036 U	0.04 U	1.7
Fluorene	MG/KG	86-73-7	7 - 68	0.0019 - 0.022	0.007 - 0.21	0.011	0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
Carbazole	MG/KG	86-74-8	10 - 68	0.0017 - 0.055	0.007 - 0.21	0.010	0.0057 J	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.0035 J	0.015 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.007 - 0.21		0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 UJ	0.008 U	0.015 U
Pentachlorophenol	MG/KG	87-86-5	0 - 68	-	0.036 - 5.4		0.58 U	0.2 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.2 UJ	0.37 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
2-Nitroaniline	MG/KG	88-74-4	0 - 68	-	0.18 - 5.4		0.58 U	0.2 U	0.19 U	0.2 U	0.22 UJ	0.19 UJ	0.19 UJ	0.19 U	0.2 U	0.37 U
2-Nitrophenol	MG/KG	88-75-5	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
1-Methylnaphthalene	MG/KG	90-12-0	6 - 68	0.002 - 0.06	0.007 - 0.072	0.009	0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
Naphthalene	MG/KG	91-20-3	24 - 68	0.0014 - 0.54	0.007 - 0.21	0.022	0.0067 J	0.0037 J	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.0044 J	0.022
2-Methylnaphthalene	MG/KG	91-57-6	7 - 68	0.0019 - 0.1	0.007 - 0.19	0.011	0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 68	-	0.007 - 0.21		0.023 U	0.0077 U	0.0077 U	0.0078 U	0.0085 U	0.0075 U	0.0075 U	0.0073 U	0.008 U	0.015 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Biphenyl	MG/KG	92-52-4	21 - 68	0.0017 - 14	0.034 - 1.1	0.312	0.01 J	0.007 J	0.0034 J	0.039 U	0.042 U	0.0044 J	0.037 U	0.036 U	0.0071 J	0.075
2-Methylphenol	MG/KG	95-48-7	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
2-Chlorophenol	MG/KG	95-57-8	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 68	-	0.034 - 1.1		0.11 U	0.038 U	0.038 U	0.039 U	0.042 U	0.037 U	0.037 U	0.036 U	0.04 U	0.071 U
Acetophenone	MG/KG	98-86-2	6 - 68	0.0034 - 0.0083	0.036 - 2.1	0.075	0.23 U	0.0083 J	0.077 U	0.078 U	0.085 U	0.075 U	0.075 U	0.073 U	0.08 U	0.15 U
Nitrobenzene	MG/KG	98-95-3	0 - 68	-	0.036 - 2.1		0.23 U	0.077 U	0.076 U	0.078 U	0.084 U	0.075 U	0.075 U	0.073 U	0.08 U	0.14 U
3-Nitroaniline	MG/KG	99-09-2	0 - 68	-	0.18 - 5.4		0.58 U	0.2 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.2 U	0.37 U
Volatile Organic Compounds																
Ethylbenzene	MG/KG	100-41-4	7 - 68	0.00027 - 0.37	0.002 - 1.9	0.030	0.00027 J	0.00033 J	0.0045 U	0.00029 J	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Styrene	MG/KG	100-42-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-709 OC-SB-709-2_0/4_0-XXX 11/6/2019 2- 4	SB-709 OC-SB-709-4_0/6_0-XXX 11/6/2019 4- 6	SB-709 OC-SB-709-6_0/8_0-XXX 11/6/2019 6- 8	SB-709 OC-SB-709-8_0/10-XXX 11/6/2019 8- 10	SB-710 OC-SB-710-2_0/4_0-XXX 11/4/2019 2- 4	SB-710 OC-SB-710-4_0/6_0-XXX 11/4/2019 4- 6	SB-710 OC-SB-710-6_0/8_0-XXX 11/4/2019 6- 8	SB-710 OC-SB-710-8_0/10-XXX 11/4/2019 8- 10	SB-711 OC-SB-711-0_0/2_0-XXX 11/12/2019 0- 2	SB-711 OC-SB-711-2_0/4_0-XXX 11/12/2019 2- 4
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Propylbenzene	MG/KG	103-65-1	3 - 68	0.00049 - 0.007	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
n-Butylbenzene	MG/KG	104-51-8	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 UJ	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	36 - 68	0.00076 - 8	0.004 - 1.2	0.179	0.003 J	0.0027 J	0.0045 U	0.0037 U	0.0071	0.035	0.0039	0.00081 J	0.0017 J	3.2
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	27 - 68	0.00056 - 6.3	0.004 - 1.2	0.143	0.0012 J	0.00077 J	0.0045 U	0.0037 U	0.0014 J	0.018	0.0018 J	0.0052 U	0.0013 J	2.6
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 68	-	0.018 - 9.3		0.019 U	0.022 U	0.023 U	0.018 UJ	0.024 U	0.018 U	0.019 U	0.026 U	0.03 U	9.3 U
Isopropyl ether	MG/KG	108-20-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	6 - 68	0.00037 - 0.0014	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Bromobenzene	MG/KG	108-86-1	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Toluene	MG/KG	108-88-3	10 - 68	0.00029 - 0.0042	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.00029 J	0.0037 U	0.0052 U	0.0059 U	1.9 U
Chlorobenzene	MG/KG	108-90-7	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 68	-	0.023 - 19		0.039 U	0.044 U	0.045 U	0.037 UJ	0.048 U	0.037 U	0.037 U	0.052 U	0.059 U	19 U
Cyclohexane	MG/KG	110-82-7	0 - 68	-	0.018 - 9.3		0.019 U	0.022 U	0.023 U	0.018 U	0.024 U	0.018 U	0.019 U	0.026 U	0.03 U	9.3 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	10 - 68	0.00036 - 0.0025	0.002 - 1.9	0.032	0.00052 J	0.00089 J	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,4-Dioxane	MG/KG	123-91-1	0 - 68	-	0.18 - 93		0.19 U	0.22 U	0.23 U	0.18 UJ	0.24 U	0.18 U	0.19 U	0.26 U	0.3 U	93 U
Dibromochloromethane	MG/KG	124-48-1	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Tetrachloroethene	MG/KG	127-18-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Xylenes, Total	MG/KG	1330-20-7	7 - 68	0.00075 - 0.0026	0.004 - 1.9	0.032	0.00075 J	0.0011 J	0.00076 J	0.00088 J	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 UJ	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Xylenes (m&p)	MG/KG	179601-23-1	7 - 68	0.00075 - 0.0014	0.004 - 1.9	0.032	0.00075 J	0.0011 J	0.00076 J	0.00088 J	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 68	0.00032 - 0.0004	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.00035 J	0.0037 U	0.0052 U	0.0059 U	1.9 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
2-Hexanone	MG/KG	591-78-6	0 - 68	-	0.018 - 9.3		0.019 U	0.022 U	0.023 U	0.018 UJ	0.024 U	0.018 U	0.019 U	0.026 U	0.03 U	9.3 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Diethyl ether	MG/KG	60-29-7	2 - 68	0.0028 - 0.0034	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Acetone	MG/KG	67-64-1	38 - 68	0.0042 - 0.099	0.19 - 93	1.580	0.033 J	0.077 J	0.022 J	0.011 J-	0.015 J	0.03 J	0.03 J	0.0083 J	0.3 U	93 U
Chloroform	MG/KG	67-66-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Benzene	MG/KG	71-43-2	5 - 68	0.0002 - 0.0008	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Bromomethane	MG/KG	74-83-9	0 - 68	-	0.004 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 UJ
Chloromethane	MG/KG	74-87-3	0 - 68	-	0.004 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Dibromomethane	MG/KG	74-95-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Bromochloromethane	MG/KG	74-97-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Chloroethane	MG/KG	75-00-3	0 - 68	-	0.004 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 UJ
Vinyl chloride	MG/KG	75-01-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Methylene chloride	MG/KG	75-09-2	0 - 68	-	0.004 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.026 U	1.9 U
Carbon disulfide	MG/KG	75-15-0	10 - 68	0.0024 - 0.0066	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0057	0.0027 J	0.0052 U	0.0059 U	1.9 U
Bromoform	MG/KG	75-25-2	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Bromodichloromethane	MG/KG	75-27-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,1-Dichloroethane	MG/KG	75-34-3	2 - 68	0.0007 - 0.0008	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 68	-	0.004 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 68	-	0.004 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 68	-	0.004 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
2-Butanone	MG/KG	78-93-3	26 - 68	0.0044 - 0.56	0.018 - 9.3	0.173	0.0095 J	0.016 J+	0.023 U	0.018 U	0.024 U	0.007 J+	0.018 J+	0.026 U	0.03 U	9.3 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Trichloroethene	MG/KG	79-01-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 68	0.0063 - 0.33	0.037 - 19	0.255	0.039 U	0.044 U	0.045 U	0.037 UJ	0.048 U	0.037 U	0.037 U	0.052 U	0.059 U	19 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 UJ	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-709 OC-SB-709-2_0/4_0-XXX 11/6/2019 2- 4	SB-709 OC-SB-709-4_0/6_0-XXX 11/6/2019 4- 6	SB-709 OC-SB-709-6_0/8_0-XXX 11/6/2019 6- 8	SB-709 OC-SB-709-8_0/10-XXX 11/6/2019 8- 10	SB-710 OC-SB-710-2_0/4_0-XXX 11/4/2019 2- 4	SB-710 OC-SB-710-4_0/6_0-XXX 11/4/2019 4- 6	SB-710 OC-SB-710-6_0/8_0-XXX 11/4/2019 6- 8	SB-710 OC-SB-710-8_0/10-XXX 11/4/2019 8- 10	SB-711 OC-SB-711-0_0/2_0-XXX 11/12/2019 0- 2	SB-711 OC-SB-711-2_0/4_0-XXX 11/12/2019 2- 4
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Naphthalene	MG/KG	91-20-3	8 - 68	0.0009 - 0.18	0.018 - 9.3	0.128	0.019 U	0.022 U	0.023 U	0.018 UJ	0.024 U	0.018 U	0.019 U	0.026 U	0.03 U	9.3 U
Xylene, o	MG/KG	95-47-6	2 - 68	0.00075 - 0.0016	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	4 - 68	0.0027 - 0.016	0.002 - 1.9	0.032	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 68	-	0.018 - 9.3		0.019 U	0.022 U	0.023 U	0.018 UJ	0.024 U	0.018 U	0.019 U	0.026 U	0.03 U	9.3 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 UJ	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Isopropylbenzene	MG/KG	98-82-8	4 - 68	0.0012 - 0.2	0.002 - 1.9	0.028	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 68	-	0.002 - 1.9		0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
4-iso-Propyltoluene	MG/KG	99-87-6	8 - 68	0.00041 - 0.42	0.002 - 1.9	0.031	0.0039 U	0.0044 U	0.0045 U	0.0037 U	0.0048 U	0.0037 U	0.0037 U	0.0052 U	0.0059 U	1.9 U
Hydrazine/aldehydes																
Hydrazine	MG/KG	302-01-2	31 - 63	0.00062 - 0.086	0.002 - 0.007	0.005	0.0058 U	0.0069 U	0.0057 U	0.0057 UJ	0.0057 UJ	0.0018 J	0.0016 J	0.0018 J	0.0019 J	0.0057
Formaldehyde	MG/KG	50-00-0	26 - 63	0.096 - 11	0.11 - 2.6	1.612	2.1 J	2.9 J	2.4 UJ	2.3 UJ	2 J	4 J	11 J	2.2 UJ	2.5 UJ	1.5 J
UDMH	MG/KG	57-14-7	0 - 63	-	0.005 - 0.007		0.0058 U	0.0069 U	0.0057 U	0.0057 U	0.0057 U	0.0058 U	0.0058 U	0.0054 U	0.0059 U	0.0055 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 63	-	0.005 - 0.007		0.0058 UJ	0.0069 UJ	0.0057 UJ	0.0057 UJ	0.0057 UJ	0.0058 UJ	0.0058 UJ	0.0054 UJ	0.0059 U	0.0055 U
Acetaldehyde	MG/KG	75-07-0	0 - 5	-	0.23 - 0.24											

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-711 OC-SB-711-4_0/6_0-XXX 11/12/2019 4- 6	SB-711 OC-SB-711-6_0/8_0-XXX 11/12/2019 6- 8	SB-711 OC-SB-711-8_0/10-XXX 11/12/2019 8- 10	SB-712 OC-SB-712-0_0/2_0-XXX 11/11/2019 0- 2	SB-712 OC-SB-712-2_0/4_0-XXX 11/11/2019 2- 4	SB-712 OC-SB-712-4_0/6_0-XXX 11/11/2019 4- 6	SB-712 OC-SB-712-6_0/8_0-XXX 11/11/2019 6- 8	SB-712 OC-SB-712-8_0/10-XXX 11/11/2019 8- 10	SS-420 OC-SS-420-0_0/1_0-XXX 9/15/2009 0- 1	SS-421 OC-SS-421-0_0/1_0-XXX 9/15/2009 0- 1
Dimethylformamide																
Dimethylformamide	MG/KG	68-12-2	0 - 63	-	0.14 - 0.84		0.17 U	0.17 U	0.16 U	0.19 U	0.19 U	0.18 U	0.21 U	0.22 U	0.5 U	
Inorganics																
Sulfate	MG/KG	14808-79-8	58 - 58	12 - 18000	- - -	2914	290 J	12 J	43 J	4000 J	520 J	12000 J	1500 J	180 J		
Chloride	MG/KG	16887-00-6	18 - 58	4.1 - 19	10 - 13	6.39	11 UJ	12 UJ	7.2 J	12 UJ	6.8 J	11 UJ	12 J	6.7 J		
Ammonia	MG/KG	7664-41-7	55 - 58	3.5 - 58	6.6 - 9.9	15.25	42	58	50	4.4 J	3.6 J	18	11	9.9		
Sulfate	MG/KG	14808-79-8	10 - 10	57 - 13000	- -	3460									1100	2300
Chloride	MG/KG	16887-00-6	1 - 10	44 - 44	15 - 25	13.35									22 U	25 U
Total Organic Carbon	MG/KG	HLA0011	1 - 1	9400 - 9400	- - -	9400										
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37									7.5 U	7.4 U
Metals & Inorganics																
Chromium, Hexavalent	MG/KG	18540-29-9	54 - 58	0.18 - 20.8	0.44 - 0.49	2.59	0.49	0.18 J	0.37 J	5.5	0.71	0.56	1.4	2.8		
Aluminum	MG/KG	7429-90-5	68 - 68	2100 - 15000	- - -	7328	4000	3100	3000	8100	10000	8400	10000	4500	6600	6800
Iron	MG/KG	7439-89-6	68 - 68	2700 - 23000	- - -	9543	5300	2800	2700	9800	11000	8900	13000	7700	9300	9000
Lead	MG/KG	7439-92-1	68 - 68	1.7 - 22	- - -	6.92	5.7	1.7	1.7	12	6.3	20	19	2.8	5.8	5.3
Magnesium	MG/KG	7439-95-4	68 - 68	820 - 7300	- - -	2642	940	860	900	3300	3800	2200	4000	2600	2200	2400
Manganese	MG/KG	7439-96-5	68 - 68	31 - 370	- - -	128.24	45	42	45	160	190	130	210	120	110	110
Mercury	MG/KG	7439-97-6	30 - 68	0.0086 - 0.19	0.019 - 0.21	0.04	0.029	0.024 U	0.025 U	0.048	0.021 U	0.069	0.087	0.021 U	0.14 U	0.2 U
Nickel	MG/KG	7440-02-0	68 - 68	2.5 - 40	- - -	11.55	6.4	4.6 J	4.5 J	10	24	9.3	21	11	7.9	8
Silver	MG/KG	7440-22-4	10 - 68	0.13 - 1.2	0.61 - 0.82	0.39	0.7 U	0.68 U	0.81 U	0.73 U	0.65 U	0.65 U	0.66 U	0.66 U	0.42 J	0.61 J
Sodium	MG/KG	7440-23-5	60 - 68	46 - 470	150 - 180	144.91	87 J	81 J	95 J	170	200	170	220	110 J	79 J	200
Thallium	MG/KG	7440-28-0	0 - 68	-	1.1 - 8.2		7 U	6.8 U	8.1 U	7.3 U	6.5 U	6.5 U	6.6 U	6.6 U	1.1 U	1.4 U
Tin	MG/KG	7440-31-5	46 - 68	0.5 - 36	2.1 - 2.7	4.07	2.3 U	2.3 U	2.7 U	0.69 J	0.84 J	0.72 J	1.6 J	2.2 U	18 J	20 J
Antimony	MG/KG	7440-36-0	17 - 68	0.45 - 1.2	0.57 - 83	5.97	17 U	17 U	20 U	18 U	16 U	16 U	0.86 J	0.53 J	0.57 UJ	0.69 UJ
Arsenic	MG/KG	7440-38-2	68 - 68	0.76 - 33	- - -	8.47	3.9	0.91 J	1.5 J	7.7	8.9	7.5	13	5.5	9.5	8.4
Barium	MG/KG	7440-39-3	68 - 68	6.6 - 89	- - -	33.80	18	6.6	11	61	43	34	41	15	43	52
Beryllium	MG/KG	7440-41-7	68 - 68	0.08 - 0.67	- - -	0.32	0.16 J	0.11 J	0.12 J	0.36	0.54	0.37	0.5	0.16 J	0.24	0.25 J
Cadmium	MG/KG	7440-43-9	44 - 68	0.035 - 9.3	0.21 - 0.26	0.40	9.3	0.79	0.054 J	0.16 J	0.062 J	0.067 J	0.098 J	0.22 U	0.33	0.34
Chromium	MG/KG	7440-47-3	68 - 68	5.3 - 1300	- - -	97.51	28	5.9	5.3	78	35	38	38	130	48	52
Cobalt	MG/KG	7440-48-4	68 - 68	0.79 - 13	- - -	4.03	1.5	0.92	1	4.2	5.8	3.7	7.1	2.5	3.5	3.5
Copper	MG/KG	7440-50-8	68 - 68	0.75 - 27	- - -	8.89	4.3	2.8	3.6	11	11	11	23	4.8	7.7	7.7
Vanadium	MG/KG	7440-62-2	68 - 68	5.2 - 40	- - -	15.83	7.4	5.2	5.4	19	22	17	25	12	12	13
Zinc	MG/KG	7440-66-6	68 - 68	6.4 - 78	- - -	22.89	63	8.8	9.2	25	24	24	41	15	18	18
Calcium	MG/KG	7440-70-2	68 - 68	550 - 110000	- - -	10629	1200	1000	1300	22000	4100	15000	3300	1500	12000	29000
Selenium	MG/KG	7782-49-2	10 - 68	0.5 - 1.1	0.57 - 5.5	1.78	0.5 J	4.5 U	0.7 J	4.8 U	0.55 J	4.3 U	4.4 U	4.4 U	0.57 U	0.69 U
Potassium	MG/KG	9/7/7440	68 - 68	340 - 4300	- - -	1220	460	440	620	1500	2100	1500	1800	1200	1900	1400
Phthalates																
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	-	0.11 - 0.12										0.11 U	
Semi-Volatile Organic Compounds																
4-Nitroaniline	MG/KG	100-01-6	0 - 68	-	0.18 - 5.4		4.7 U	0.19 U	0.22 U	1 U	0.19 U	0.19 U	0.57 U	0.19 U	0.18 U	0.21 U
4-Nitrophenol	MG/KG	100-02-7	0 - 68	-	0.18 - 5.4		4.7 U	0.19 U	0.22 U	1 U	0.19 U	0.19 U	0.57 U	0.19 U	0.18 U	0.21 U
Benzyl alcohol	MG/KG	100-51-6	1 - 68	0.059 - 0.059	0.034 - 1.1	0.044	0.92 U	0.059	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.074 U	0.084 U
Benzaldehyde	MG/KG	100-52-7	7 - 68	0.0067 - 0.23	0.036 - 2.1	0.080	1.9 U	0.076 U	0.087 U	0.4 U	0.073 U	0.0067 J	0.22 U	0.074 U	0.015 J	0.042 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 68	0.19 - 0.19	0.034 - 1.1	0.041	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.044	0.019									0.037 U	0.015 J
Azobenzene	MG/KG	103-33-3	0 - 68	-	0.036 - 7.5		7.5 U	1.9 U	0.42 U	0.39 U	0.36 U	0.37 U	1.8 U	0.36 U	0.037 U	0.042 U
Caprolactam	MG/KG	105-60-2	0 - 68	-	0.036 - 5.4		4.7 U	0.19 U	0.22 U	1 U	0.19 U	0.19 U	0.57 U	0.19 U	0.037 U	0.042 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 68	0.0039 - 0.012	0.034 - 1.1	0.040	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
4-Chloroaniline	MG/KG	106-47-8	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.074 U	0.084 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 68	-	0.007 - 0.21		0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0075 U	0.022 U	0.0074 U	0.037 U	0.042 U
Phenol	MG/KG	108-95-2	13 - 68	0.011 - 8.8	0.034 - 1.1	0.182	0.92 U	0.12	0.043 U	0.2 U	0.036 U	0.014 J	0.11 U	0.036 U	0.037 U	0.042 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 68	-	0.007 - 0.21		0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0075 U	0.022 U	0.0074 U	0.037 U	0.042 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	54 - 68	0.043 - 420	0.34 - 0.41	13.127	420	0.056 J	0.21 J	2.1	0.043 J	0.57	1.2	0.14 J	0.52 EB	1.6 EB
Di-n-octylphthalate	MG/KG	117-84-0	2 - 68	0.023 - 0.061	0.034 - 1.1	0.041	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 68	-	0.007 - 0.21		0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0075 U	0.022 U	0.0074 U	0.037 U	0.042 U
Diphenylmethanone	MG/KG	119-61-9	0 - 10	-	0.036 - 0.044										0.037 U	0.042 U
Anthracene	MG/KG	120-12-7	13 - 68	0.0021 - 0.06	0.007 - 0.21	0.010	0.06 J	0.0076 U	0.0087 U	0.04 U	0.0026 J	0.0043 J	0.036	0.0074 U	0.037 U	0.042 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	12 - 68	0.0017 - 0.068	0.034 - 1.1	0.037	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.0052 J	0.036 U	0.037 U	0.042 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 68	-	0.007 - 0.21		0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0075 U	0.022 U	0.0074 U	0.037 U	0.042 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-711 OC-SB-711-4_0/6_0-XXX 11/12/2019 4- 6	SB-711 OC-SB-711-6_0/8_0-XXX 11/12/2019 6- 8	SB-711 OC-SB-711-8_0/10-XXX 11/12/2019 8- 10	SB-712 OC-SB-712-0_0/2_0-XXX 11/11/2019 0- 2	SB-712 OC-SB-712-2_0/4_0-XXX 11/11/2019 2- 4	SB-712 OC-SB-712-4_0/6_0-XXX 11/11/2019 4- 6	SB-712 OC-SB-712-6_0/8_0-XXX 11/11/2019 6- 8	SB-712 OC-SB-712-8_0/10-XXX 11/11/2019 8- 10	SS-420 OC-SS-420-0_0/1_0-XXX 9/15/2009 0- 1	SS-421 OC-SS-421-0_0/1_0-XXX 9/15/2009 0- 1
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.039	0.018									0.014 J	
Pyrene	MG/KG	129-00-0	38 - 68	0.0017 - 0.15	0.007 - 0.21	0.018	0.19 U	0.0076 U	0.0048 J	0.017 J	0.015	0.026	0.15	0.0074 U	0.013 J	0.016 J
Dimethylphthalate	MG/KG	131-11-3	1 - 68	0.002 - 0.002	0.034 - 1.1	0.040	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Dibenzofuran	MG/KG	132-64-9	3 - 68	0.0088 - 0.029	0.034 - 1.1	0.037	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.0094 J	0.036 U	0.037 U	0.042 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	-	0.036 - 0.044										0.037 U	0.042 U
Atrazine	MG/KG	1912-24-9	0 - 68	-	0.036 - 2.1		1.9 U	0.076 U	0.087 U	0.4 U	0.073 U	0.075 U	0.22 U	0.074 U	0.037 U	0.042 U
Benzo(ghi)perylene	MG/KG	191-24-2	22 - 68	0.0018 - 0.056	0.007 - 0.21	0.012	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0082	0.024	0.056	0.0074 U	0.037 U	0.042 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	21 - 68	0.0017 - 0.038	0.007 - 0.21	0.012	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0065 J	0.021	0.038	0.0074 U	0.037 U	0.042 U
Benzo(b)fluoranthene	MG/KG	205-99-2	29 - 68	0.0021 - 0.068	0.007 - 0.21	0.014	0.19 U	0.0076 U	0.0087 U	0.014 J	0.012	0.039	0.068	0.0074 U	0.037 U	0.042 U
Fluoranthene	MG/KG	206-44-0	40 - 68	0.0028 - 0.16	0.007 - 0.21	0.018	0.16 J	0.0076 U	0.0048 J	0.019 J	0.018	0.03	0.12	0.0074 U	0.012 J	0.02 J
Benzo(k)fluoranthene	MG/KG	207-08-9	15 - 68	0.003 - 0.032	0.007 - 0.21	0.011	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0037 J	0.013	0.032	0.0074 U	0.037 U	0.042 U
Acenaphthylene	MG/KG	208-96-8	7 - 68	0.0016 - 0.0063	0.007 - 0.21	0.010	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0047 J	0.0063 J	0.0074 U	0.037 U	0.042 U
Chrysene	MG/KG	218-01-9	31 - 68	0.0021 - 0.075	0.007 - 0.21	0.014	0.19 U	0.0076 U	0.0026 J	0.012 J	0.0086	0.027	0.075	0.0074 U	0.037 U	0.042 U
Benzo(a)pyrene	MG/KG	50-32-8	23 - 68	0.0026 - 0.067	0.007 - 0.21	0.013	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0095	0.023	0.067	0.0074 U	0.011 J	0.042 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 68	-	0.036 - 11		9.2 U	0.38 U	0.43 U	2 U	0.36 U	0.37 U	1.1 U	0.36 U	0.037 U	0.042 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 68	-	0.18 - 5.4		4.7 U	0.19 U	0.22 U	1 U	0.19 U	0.19 U	0.57 U	0.19 U	0.18 U	0.21 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	9 - 68	0.0021 - 0.012	0.007 - 0.21	0.010	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0061 J	0.012 J	0.0074 U	0.037 U	0.042 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Benzo(a)anthracene	MG/KG	56-55-3	31 - 68	0.0014 - 0.072	0.007 - 0.21	0.013	0.19 U	0.0076 U	0.0022 J	0.011 J	0.0076	0.02	0.072	0.0074 U	0.037 U	0.042 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.074 U	0.084 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 68	-	0.007 - 0.21		0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0075 U	0.022 U	0.0074 U	0.037 U	0.042 U
Aniline	MG/KG	62-53-3	1 - 68	0.017 - 0.017	0.034 - 1.1	0.041	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 UJ	0.042 UJ
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 68	-	0.006 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.0056 U	0.042 U
Benzoic Acid	MG/KG	65-85-0	0 - 68	-	0.18 - 5.4		4.7 U	0.19 U	0.22 U	1 U	0.19 U	0.19 U	0.57 U	0.19 U	0.18 U	0.21 U
Hexachloroethane	MG/KG	67-72-1	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	2 - 68	0.0064 - 0.031	0.034 - 1.1	0.040	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.074 U	0.084 U
Isophorone	MG/KG	78-59-1	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Acenaphthene	MG/KG	83-32-9	3 - 68	0.0055 - 0.017	0.007 - 0.21	0.011	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0075 U	0.017 J	0.0074 U	0.037 U	0.042 U
Diethylphthalate	MG/KG	84-66-2	2 - 68	0.02 - 0.025	0.034 - 1.1	0.041	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Di-n-butylphthalate	MG/KG	84-74-2	5 - 68	0.018 - 2.1	0.034 - 1.1	0.069	0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Phenanthrene	MG/KG	85-01-8	43 - 68	0.0022 - 0.66	0.007 - 0.21	0.025	0.66	0.0076 U	0.0081 J	0.04 U	0.01	0.017	0.093	0.0074 U	0.044 U	0.05 U
Phthalic anhydride	MG/KG	85-44-9	0 - 58	-	10 - 230		230 UJ	57 UJ	13 UJ	12 UJ	11 UJ	11 UJ	54 UJ	11 UJ		
Butylbenzylphthalate	MG/KG	85-68-7	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	38 - 69	0.012 - 54	0.034 - 0.2	1.366	54	0.031 J	0.043 U	0.2 U	0.036 U	0.072	0.13	0.036 U	0.013 JEB	0.033 JEB
Fluorene	MG/KG	86-73-7	7 - 68	0.0019 - 0.022	0.007 - 0.21	0.011	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.002 J	0.012 J	0.0074 U	0.037 U	0.042 U
Carbazole	MG/KG	86-74-8	10 - 68	0.0017 - 0.055	0.007 - 0.21	0.010	0.19 U	0.0076 U	0.0087 U	0.04 U	0.0017 J	0.0024 J	0.0081 J	0.0074 U	0.037 U	0.042 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.007 - 0.21		0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0075 U	0.022 U	0.0074 U	0.037 U	0.042 U
Pentachlorophenol	MG/KG	87-86-5	0 - 68	-	0.036 - 5.4		4.7 U	0.19 U	0.22 U	1 U	0.19 U	0.19 U	0.57 U	0.19 U	0.037 U	0.042 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
2-Nitroaniline	MG/KG	88-74-4	0 - 68	-	0.18 - 5.4		4.7 U	0.19 U	0.22 U	1 U	0.19 U	0.19 U	0.57 U	0.19 U	0.18 U	0.21 U
2-Nitrophenol	MG/KG	88-75-5	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
1-Methylnaphthalene	MG/KG	90-12-0	6 - 68	0.002 - 0.06	0.007 - 0.072	0.009	0.053 J	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0021 J	0.022 U	0.0074 U	0.037 U	0.042 U
Naphthalene	MG/KG	91-20-3	24 - 68	0.0014 - 0.54	0.007 - 0.21	0.022	0.079 J	0.0076 U	0.0032 J	0.04 U	0.0021 J	0.0057 J	0.011 J	0.0074 U	0.089 U	0.1 U
2-Methylnaphthalene	MG/KG	91-57-6	7 - 68	0.0019 - 0.1	0.007 - 0.19	0.011	0.19 U	0.0076 U	0.0027 J	0.04 U	0.0073 U	0.0023 J	0.022 U	0.0074 U	0.037 U	0.042 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 68	-	0.007 - 0.21		0.19 U	0.0076 U	0.0087 U	0.04 U	0.0073 U	0.0075 U	0.022 U	0.0074 U	0.037 U	0.042 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.074 U	0.084 U
Biphenyl	MG/KG	92-52-4	21 - 68	0.0017 - 14	0.034 - 1.1	0.312	14	0.038 U	0.043 U	0.0097 J	0.0017 J	0.0034 J	0.11 U	0.036 U	0.037 U	0.042 U
2-Methylphenol	MG/KG	95-48-7	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
2-Chlorophenol	MG/KG	95-57-8	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 68	-	0.034 - 1.1		0.92 U	0.038 U	0.043 U	0.2 U	0.036 U	0.037 U	0.11 U	0.036 U	0.037 U	0.042 U
Acetophenone	MG/KG	98-86-2	6 - 68	0.0034 - 0.0083	0.036 - 2.1	0.075	1.9 U	0.076 U	0.087 U	0.4 U	0.073 U	0.0044 J	0.22 U	0.074 U	0.037 U	0.042 U
Nitrobenzene	MG/KG	98-95-3	0 - 68	-	0.036 - 2.1		1.9 U	0.076 U	0.086 U	0.4 U	0.073 U	0.075 U	0.22 U	0.073 U	0.037 U	0.042 U
3-Nitroaniline	MG/KG	99-09-2	0 - 68	-	0.18 - 5.4		4.7 U	0.19 U	0.22 U	1 U	0.19 U	0.19 U	0.57 U	0.19 U	0.18 U	0.21 U
Volatile Organic Compounds																
Ethylbenzene	MG/KG	100-41-4	7 - 68	0.00027 - 0.37	0.002 - 1.9	0.030	0.37 J	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Styrene	MG/KG	100-42-5	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-711 OC-SB-711-4_0/6_0-XXX 11/12/2019 4- 6	SB-711 OC-SB-711-6_0/8_0-XXX 11/12/2019 6- 8	SB-711 OC-SB-711-8_0/10-XXX 11/12/2019 8- 10	SB-712 OC-SB-712-0_0/2_0-XXX 11/11/2019 0- 2	SB-712 OC-SB-712-2_0/4_0-XXX 11/11/2019 2- 4	SB-712 OC-SB-712-4_0/6_0-XXX 11/11/2019 4- 6	SB-712 OC-SB-712-6_0/8_0-XXX 11/11/2019 6- 8	SB-712 OC-SB-712-8_0/10-XXX 11/11/2019 8- 10	SS-420 OC-SS-420-0_0/1_0-XXX 9/15/2009 0- 1	SS-421 OC-SS-421-0_0/1_0-XXX 9/15/2009 0- 1
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Propylbenzene	MG/KG	103-65-1	3 - 68	0.00049 - 0.007	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
n-Butylbenzene	MG/KG	104-51-8	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	36 - 68	0.00076 - 8	0.004 - 1.2	0.179	8	0.004 J	1.2 U	0.0046 U	0.002 J	0.004 J	0.0086	0.0024 J	0.0046 U	0.006 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	27 - 68	0.00056 - 6.3	0.004 - 1.2	0.143	6.3	0.002 J	1.2 U	0.0046 U	0.00067 J	0.0015 J	0.0033 J	0.00059 J	0.0046 U	0.006 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 68	-	0.018 - 9.3		5.2 U	0.024 U	6.1 U	0.023 U	0.022 U	0.026 U	0.022 U	0.021 U	0.023 U	0.03 U
Isopropyl ether	MG/KG	108-20-3	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	6 - 68	0.00037 - 0.0014	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Bromobenzene	MG/KG	108-86-1	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Toluene	MG/KG	108-88-3	10 - 68	0.00029 - 0.0042	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Chlorobenzene	MG/KG	108-90-7	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 68	-	0.023 - 19		10 U	0.047 U	12 U	0.046 U	0.043 U	0.053 U	0.044 U	0.042 U	0.023 U	0.03 U
Cyclohexane	MG/KG	110-82-7	0 - 68	-	0.018 - 9.3		5.2 U	0.024 U	6.1 U	0.023 U	0.022 U	0.026 U	0.022 U	0.021 U	0.023 U	0.03 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	10 - 68	0.00036 - 0.0025	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,4-Dioxane	MG/KG	123-91-1	0 - 68	-	0.18 - 93		52 U	0.24 U	61 U	0.23 U	0.22 U	0.26 U	0.22 U	0.21 U	0.23 UJ	0.3 UJ
Dibromochloromethane	MG/KG	124-48-1	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Tetrachloroethene	MG/KG	127-18-4	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Xylenes, Total	MG/KG	1330-20-7	7 - 68	0.00075 - 0.0026	0.004 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0046 U	0.006 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Xylenes (m&p)	MG/KG	179601-23-1	7 - 68	0.00075 - 0.0014	0.004 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0046 U	0.006 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 68	0.00032 - 0.0004	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
2-Hexanone	MG/KG	591-78-6	0 - 68	-	0.018 - 9.3		5.2 U	0.024 U	6.1 U	0.023 U	0.022 U	0.026 U	0.022 U	0.021 U	0.023 U	0.03 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Diethyl ether	MG/KG	60-29-7	2 - 68	0.0028 - 0.0034	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Acetone	MG/KG	67-64-1	38 - 68	0.0042 - 0.099	0.19 - 93	1.580	52 U	0.24 UJ	61 U	0.23 U	0.22 U	0.26 U	0.22 U	0.21 U	0.23 UJ	0.3 UJ
Chloroform	MG/KG	67-66-3	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Benzene	MG/KG	71-43-2	5 - 68	0.0002 - 0.0008	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.00049 J	0.0042 U	0.0023 U	0.003 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Bromomethane	MG/KG	74-83-9	0 - 68	-	0.004 - 1.9		1 UJ	0.0047 U	1.2 UJ	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0046 U	0.006 U
Chloromethane	MG/KG	74-87-3	0 - 68	-	0.004 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0046 U	0.006 U
Dibromomethane	MG/KG	74-95-3	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Bromochloromethane	MG/KG	74-97-5	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Chloroethane	MG/KG	75-00-3	0 - 68	-	0.004 - 1.9		1 UJ	0.0047 U	1.2 UJ	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0046 U	0.006 U
Vinyl chloride	MG/KG	75-01-4	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Methylene chloride	MG/KG	75-09-2	0 - 68	-	0.004 - 1.9		1 U	0.01 U	1.2 U	0.027 U	0.02 U	0.022 U	0.021 U	0.024 U	0.0091 U	0.012 U
Carbon disulfide	MG/KG	75-15-0	10 - 68	0.0024 - 0.0066	0.002 - 1.9	0.032	1 U	0.0033 J	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Bromoform	MG/KG	75-25-2	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Bromodichloromethane	MG/KG	75-27-4	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,1-Dichloroethane	MG/KG	75-34-3	2 - 68	0.0007 - 0.0008	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 68	-	0.004 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0046 U	0.006 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 68	-	0.004 - 1.9		1 U	0.0047 UJ	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0046 UJ	0.006 UJ
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 68	-	0.004 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.011 U	0.015 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
2-Butanone	MG/KG	78-93-3	26 - 68	0.0044 - 0.56	0.018 - 9.3	0.173	5.2 U	0.0057 J+	6.1 U	0.023 U	0.0069 J+	0.026 U	0.022 U	0.021 U	0.023 U	0.03 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Trichloroethene	MG/KG	79-01-6	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 68	0.0063 - 0.33	0.037 - 19	0.255	0.33 J	0.047 U	12 U	0.046 U	0.043 U	0.053 U	0.044 U	0.042 U	0.046 U	0.06 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SB-711 OC-SB-711-4_0/6_0-XXX 11/12/2019 4- 6	SB-711 OC-SB-711-6_0/8_0-XXX 11/12/2019 6- 8	SB-711 OC-SB-711-8_0/10-XXX 11/12/2019 8- 10	SB-712 OC-SB-712-0_0/2_0-XXX 11/11/2019 0- 2	SB-712 OC-SB-712-2_0/4_0-XXX 11/11/2019 2- 4	SB-712 OC-SB-712-4_0/6_0-XXX 11/11/2019 4- 6	SB-712 OC-SB-712-6_0/8_0-XXX 11/11/2019 6- 8	SB-712 OC-SB-712-8_0/10-XXX 11/11/2019 8- 10	SS-420 OC-SS-420-0_0/1_0-XXX 9/15/2009 0- 1	SS-421 OC-SS-421-0_0/1_0-XXX 9/15/2009 0- 1
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Naphthalene	MG/KG	91-20-3	8 - 68	0.0009 - 0.18	0.018 - 9.3	0.128	0.15 J	0.024 U	6.1 U	0.023 U	0.022 U	0.0009 J	0.022 U	0.021 U	0.023 U	0.03 U
Xylene, o	MG/KG	95-47-6	2 - 68	0.00075 - 0.0016	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	4 - 68	0.0027 - 0.016	0.002 - 1.9	0.032	1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 68	-	0.018 - 9.3		5.2 U	0.024 U	6.1 U	0.023 U	0.022 U	0.026 U	0.022 U	0.021 U	0.023 U	0.03 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Isopropylbenzene	MG/KG	98-82-8	4 - 68	0.0012 - 0.2	0.002 - 1.9	0.028	0.2 J	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 68	-	0.002 - 1.9		1 U	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.0053 U	0.0044 U	0.0042 U	0.0023 U	0.003 U
4-iso-Propyltoluene	MG/KG	99-87-6	8 - 68	0.00041 - 0.42	0.002 - 1.9	0.031	0.42 J	0.0047 U	1.2 U	0.0046 U	0.0043 U	0.00045 J	0.0044 U	0.0042 U	0.0023 U	0.003 U
Hydrazine/aldehydes																
Hydrazine	MG/KG	302-01-2	31 - 63	0.00062 - 0.086	0.002 - 0.007	0.005	0.013	0.0059 U	0.006 U	0.0038 J	0.0077	0.0055 U	0.0056 U	0.0056 U	0.0023 U	
Formaldehyde	MG/KG	50-00-0	26 - 63	0.096 - 11	0.11 - 2.6	1.612	2.9 J	2.3 UJ	2.6 UJ	2.4 UJ	2.1 J	2 J	2.6 J	2.2 UJ	0.11 U	
UDMH	MG/KG	57-14-7	0 - 63	-	0.005 - 0.007		0.0056 U	0.0059 U	0.006 U	0.0058 U	0.0055 U	0.0055 U	0.0056 U	0.0056 U	0.0058 U	
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 63	-	0.005 - 0.007		0.0056 U	0.0059 U	0.006 U	0.0058 U	0.0055 U	0.0055 U	0.0056 U	0.0056 U	0.0058 U	
Acetaldehyde	MG/KG	75-07-0	0 - 5	-	0.23 - 0.24										0.23 UJ	

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SS-422 OC-SS-422-0_0/1_0-XXX 9/15/2009 0- 1	SS-423 OC-SS-423-0_0/1_0-XXX 9/15/2009 0- 1	SS-424 OC-SS-424-0_0/1_0-XXX 9/15/2009 0- 1	SS-425 OC-SS-425-0_0/1_0-XXX 9/15/2009 0- 1	SS-426 OC-SS-426-0_0/1_0-XXX 9/16/2009 0- 1	SS-429 OC-SS-429-0_0/1_0-XXX 9/16/2009 0- 1	SS-430 OC-SS-430-0_0/1_0-XXX 9/16/2009 0- 1	SS-431 OC-SS-431-0_0/1_0-XXX 9/16/2009 0- 1
Dimethylformamide														
Dimethylformamide	MG/KG	68-12-2	0 - 63	-	0.14 - 0.84		0.84 U		0.56 U			0.76 U		0.69 U
Inorganics														
Sulfate	MG/KG	14808-79-8	58 - 58	12 - 18000	- - -	2914								
Chloride	MG/KG	16887-00-6	18 - 58	4.1 - 19	10 - 13	6.39								
Ammonia	MG/KG	7664-41-7	55 - 58	3.5 - 58	6.6 - 9.9	15.25								
Sulfate	MG/KG	14808-79-8	10 - 10	57 - 13000	- -	3460	620	57	8100	13000	1000	920	2400	5100
Chloride	MG/KG	16887-00-6	1 - 10	44 - 44	15 - 25	13.35	44	18 U	22 U	21 U	17 U	19 U	20 U	15 U
Total Organic Carbon	MG/KG	HLA0011	1 - 1	9400 - 9400	- - -	9400			9400					
Nitrogen, as Ammonia	MG/KG	HLA0043	4 - 10	18 - 39	6.5 - 8.4	12.37	7.3 U	8.4 U	24	18	6.5 U	8.2 U	39	20
Metals & Inorganics														
Chromium, Hexavalent	MG/KG	18540-29-9	54 - 58	0.18 - 20.8	0.44 - 0.49	2.59								
Aluminum	MG/KG	7429-90-5	68 - 68	2100 - 15000	- - -	7328	7400	7800	6200	7500	7100	8000	8000	7800
Iron	MG/KG	7439-89-6	68 - 68	2700 - 23000	- - -	9543	8800	13000	9100	10000	13000	10000	20000	10000
Lead	MG/KG	7439-92-1	68 - 68	1.7 - 22	- - -	6.92	6	5.7	6.3	6.3	4.5	5.4	8.2	7.1
Magnesium	MG/KG	7439-95-4	68 - 68	820 - 7300	- - -	2642	2600	2700	1900	2500	3900	2700	2100	2700
Manganese	MG/KG	7439-96-5	68 - 68	31 - 370	- - -	128.24	120	160	100	140	250	130	370	140
Mercury	MG/KG	7439-97-6	30 - 68	0.0086 - 0.19	0.019 - 0.21	0.04	0.16 U	0.21 U	0.21 U	0.15 U	0.18 U	0.21 U	0.21 U	0.031 J
Nickel	MG/KG	7440-02-0	68 - 68	2.5 - 40	- - -	11.55	7.9	9.6	10	8.7	7.5	8.8	9.8	10
Silver	MG/KG	7440-22-4	10 - 68	0.13 - 1.2	0.61 - 0.82	0.39	0.35 J	0.63 J	0.76	1	0.13 J	1.2	0.67 J	0.7
Sodium	MG/KG	7440-23-5	60 - 68	46 - 470	150 - 180	144.91	440	46 J	62 J	96 J	74 J	250	77 J	63 J
Thallium	MG/KG	7440-28-0	0 - 68	-	1.1 - 8.2		1.5 U	1.5 U	1.3 U	1.4 U	1.2 U	1.5 U	1.7 U	1.3 U
Tin	MG/KG	7440-31-5	46 - 68	0.5 - 36	2.1 - 2.7	4.07	14 J	24 J	22 J	30 J	10 J	36 J	26 J	24 J
Antimony	MG/KG	7440-36-0	17 - 68	0.45 - 1.2	0.57 - 83	5.97	0.77 UJ	0.74 UJ	0.65 UJ	0.71 UJ	0.59 UJ	0.77 UJ	0.86 UJ	0.65 UJ
Arsenic	MG/KG	7440-38-2	68 - 68	0.76 - 33	- - -	8.47	5.6	12	7.5	8.4	3.8	8.5	23	8.4
Barium	MG/KG	7440-39-3	68 - 68	6.6 - 89	- - -	33.80	81	42	34	51	29	80	56	42
Beryllium	MG/KG	7440-41-7	68 - 68	0.08 - 0.67	- - -	0.32	0.27 J	0.29 J	0.33	0.29	0.29	0.28 J	0.31 J	0.29
Cadmium	MG/KG	7440-43-9	44 - 68	0.035 - 9.3	0.21 - 0.26	0.40	0.26 J	0.51	0.26	0.42	0.41	0.41	0.92	0.79
Chromium	MG/KG	7440-47-3	68 - 68	5.3 - 1300	- - -	97.51	36	60	55	75	28	87	66	59
Cobalt	MG/KG	7440-48-4	68 - 68	0.79 - 13	- - -	4.03	3.5	4.6	3.8	4.1	5.3	4.1	5.6	4.2
Copper	MG/KG	7440-50-8	68 - 68	0.75 - 27	- - -	8.89	7.8	8.2	7.9	8.3	7.4	8.4	8.4	9.3
Vanadium	MG/KG	7440-62-2	68 - 68	5.2 - 40	- - -	15.83	12	15	12	15	18	14	17	14
Zinc	MG/KG	7440-66-6	68 - 68	6.4 - 78	- - -	22.89	17	19	20	20	23	18	19	21
Calcium	MG/KG	7440-70-2	68 - 68	550 - 110000	- - -	10629	33000	12000	14000	35000	12000	33000	15000	13000
Selenium	MG/KG	7782-49-2	10 - 68	0.5 - 1.1	0.57 - 5.5	1.78	0.77 U	0.74 U	0.65 U	0.71 U	0.59 U	0.77 U	0.86 U	0.65 U
Potassium	MG/KG	9/7/7440	68 - 68	340 - 4300	- - -	1220	1500	1100	1100	1400	1600	1500	1000	1100
Phthalates														
Phthalic Acid/Phthalic anhydride	MG/KG	HLA0454	0 - 5	-	0.11 - 0.12		0.12 U		0.11 U			0.12 U		0.11 U
Semi-Volatile Organic Compounds														
4-Nitroaniline	MG/KG	100-01-6	0 - 68	-	0.18 - 5.4		0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U	0.22 U	0.19 U
4-Nitrophenol	MG/KG	100-02-7	0 - 68	-	0.18 - 5.4		0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U	0.22 U	0.19 U
Benzyl alcohol	MG/KG	100-51-6	1 - 68	0.059 - 0.059	0.034 - 1.1	0.044	0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U	0.088 U	0.076 U
Benzaldehyde	MG/KG	100-52-7	7 - 68	0.0067 - 0.23	0.036 - 2.1	0.080	0.039 U	0.017 J	0.038 U	0.04 U	0.036 U	0.039 U	0.06	0.038 U
4-Bromophenyl phenyl ether	MG/KG	101-55-3	1 - 68	0.19 - 0.19	0.034 - 1.1	0.041	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Diphenyl ether	MG/KG	101-84-8	2 - 10	0.015 - 0.015	0.036 - 0.044	0.019	0.039 U	0.039 U	0.038 U	0.015 J	0.036 U	0.039 U	0.044 U	0.038 U
Azobenzene	MG/KG	103-33-3	0 - 68	-	0.036 - 7.5		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Caprolactam	MG/KG	105-60-2	0 - 68	-	0.036 - 5.4		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2,4-Dimethylphenol	MG/KG	105-67-9	2 - 68	0.0039 - 0.012	0.034 - 1.1	0.040	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
4-Chloroaniline	MG/KG	106-47-8	0 - 68	-	0.034 - 1.1		0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U	0.088 U	0.076 U
2,2'-Dichlorodiisopropylether	MG/KG	108-60-1	0 - 68	-	0.007 - 0.21		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Phenol	MG/KG	108-95-2	13 - 68	0.011 - 8.8	0.034 - 1.1	0.182	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Bis(2-Chloroethyl)ether	MG/KG	111-44-4	0 - 68	-	0.007 - 0.21		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Bis(2-Chloroethoxy)methane	MG/KG	111-91-1	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Bis(2-Ethylhexyl)phthalate	MG/KG	117-81-7	54 - 68	0.043 - 420	0.34 - 0.41	13.127	0.41 EB	0.45 EB	0.38 EB	0.66 EB	0.62 EB	0.33 EB	0.4 EB	1.5 EB
Di-n-octylphthalate	MG/KG	117-84-0	2 - 68	0.023 - 0.061	0.034 - 1.1	0.041	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Hexachlorobenzene	MG/KG	118-74-1	0 - 68	-	0.007 - 0.21		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Diphenylmethanone	MG/KG	119-61-9	0 - 10	-	0.036 - 0.044		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Anthracene	MG/KG	120-12-7	13 - 68	0.0021 - 0.06	0.007 - 0.21	0.010	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	12 - 68	0.0017 - 0.068	0.034 - 1.1	0.037	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2,4-Dichlorophenol	MG/KG	120-83-2	0 - 68	-	0.007 - 0.21		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2,4-Dinitrotoluene	MG/KG	121-14-2	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SS-422 OC-SS-422-0_0/1_0-XXX 9/15/2009 0- 1	SS-423 OC-SS-423-0_0/1_0-XXX 9/15/2009 0- 1	SS-424 OC-SS-424-0_0/1_0-XXX 9/15/2009 0- 1	SS-425 OC-SS-425-0_0/1_0-XXX 9/15/2009 0- 1	SS-426 OC-SS-426-0_0/1_0-XXX 9/16/2009 0- 1	SS-429 OC-SS-429-0_0/1_0-XXX 9/16/2009 0- 1	SS-430 OC-SS-430-0_0/1_0-XXX 9/16/2009 0- 1	SS-431 OC-SS-431-0_0/1_0-XXX 9/16/2009 0- 1
Diphenylamine	MG/KG	122-39-4	2 - 5	0.014 - 0.02	0.038 - 0.039	0.018	0.039 U		0.038 U			0.039 U		0.02 J
Pyrene	MG/KG	129-00-0	38 - 68	0.0017 - 0.15	0.007 - 0.21	0.018	0.014 J	0.039 U	0.038 U	0.04 U	0.036 U	0.047	0.032 J	0.038 U
Dimethylphthalate	MG/KG	131-11-3	1 - 68	0.002 - 0.002	0.034 - 1.1	0.040	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Dibenzofuran	MG/KG	132-64-9	3 - 68	0.0088 - 0.029	0.034 - 1.1	0.037	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
3 & 4 Methylphenol	MG/KG	15831-10-4	0 - 10	-	0.036 - 0.044		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Atrazine	MG/KG	1912-24-9	0 - 68	-	0.036 - 2.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Benzo(ghi)perylene	MG/KG	191-24-2	22 - 68	0.0018 - 0.056	0.007 - 0.21	0.012	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Indeno(1,2,3-cd)pyrene	MG/KG	193-39-5	21 - 68	0.0017 - 0.038	0.007 - 0.21	0.012	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Benzo(b)fluoranthene	MG/KG	205-99-2	29 - 68	0.0021 - 0.068	0.007 - 0.21	0.014	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.023 J	0.027 J	0.014 J
Fluoranthene	MG/KG	206-44-0	40 - 68	0.0028 - 0.16	0.007 - 0.21	0.018	0.016 J	0.039 U	0.038 U	0.04 U	0.012 J	0.042	0.041 J	0.012 J
Benzo(k)fluoranthene	MG/KG	207-08-9	15 - 68	0.003 - 0.032	0.007 - 0.21	0.011	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Acenaphthylene	MG/KG	208-96-8	7 - 68	0.0016 - 0.0063	0.007 - 0.21	0.010	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Chrysene	MG/KG	218-01-9	31 - 68	0.0021 - 0.075	0.007 - 0.21	0.014	0.012 J	0.039 U	0.038 U	0.04 U	0.036 U	0.021 J	0.021 J	0.038 U
Benzo(a)pyrene	MG/KG	50-32-8	23 - 68	0.0026 - 0.067	0.007 - 0.21	0.013	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.014 J	0.017 J	0.038 U
2,4-Dinitrophenol	MG/KG	51-28-5	0 - 68	-	0.036 - 11		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
4,6-Dinitro-2-methylphenol	MG/KG	534-52-1	0 - 68	-	0.18 - 5.4		0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U	0.22 U	0.19 U
Dibenz(a,h)anthracene	MG/KG	53-70-3	9 - 68	0.0021 - 0.012	0.007 - 0.21	0.010	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
1,3-Dichlorobenzene	MG/KG	541-73-1	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Benzo(a)anthracene	MG/KG	56-55-3	31 - 68	0.0014 - 0.072	0.007 - 0.21	0.013	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.019 J	0.017 J	0.038 U
2,3,4,6-Tetrachlorophenol	MG/KG	58-90-2	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
4-Chloro-3-methylphenol	MG/KG	59-50-7	0 - 68	-	0.034 - 1.1		0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U	0.088 U	0.076 U
2,6-Dinitrotoluene	MG/KG	606-20-2	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
N-Nitrosodi-n-propylamine	MG/KG	621-64-7	0 - 68	-	0.007 - 0.21		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Aniline	MG/KG	62-53-3	1 - 68	0.017 - 0.017	0.034 - 1.1	0.041	0.039 UJ	0.039 UJ	0.038 UJ	0.04 UJ	0.036 UJ	0.039 UJ	0.044 UJ	0.038 UJ
N-Nitrosodimethylamine	MG/KG	62-75-9	0 - 68	-	0.006 - 1.1		0.0059 U	0.039 U	0.0057 U	0.04 U	0.036 U	0.006 U	0.044 U	0.0057 U
Benzoic Acid	MG/KG	65-85-0	0 - 68	-	0.18 - 5.4		0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U	0.22 U	0.19 U
Hexachloroethane	MG/KG	67-72-1	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
4-Chlorophenyl phenyl ether	MG/KG	7005-72-3	2 - 68	0.0064 - 0.031	0.034 - 1.1	0.040	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Hexachlorocyclopentadiene	MG/KG	77-47-4	0 - 68	-	0.034 - 1.1		0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U	0.088 U	0.076 U
Isophorone	MG/KG	78-59-1	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Acenaphthene	MG/KG	83-32-9	3 - 68	0.0055 - 0.017	0.007 - 0.21	0.011	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Diethylphthalate	MG/KG	84-66-2	2 - 68	0.02 - 0.025	0.034 - 1.1	0.041	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Di-n-butylphthalate	MG/KG	84-74-2	5 - 68	0.018 - 2.1	0.034 - 1.1	0.069	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Phenanthrene	MG/KG	85-01-8	43 - 68	0.0022 - 0.66	0.007 - 0.21	0.025	0.047 U	0.047 U	0.046 U	0.048 U	0.043 U	0.047 U	0.015 J	0.046 U
Phthalic anhydride	MG/KG	85-44-9	0 - 58	-	10 - 230									
Butylbenzylphthalate	MG/KG	85-68-7	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
N-Nitrosodiphenylamine	MG/KG	86-30-6	38 - 69	0.012 - 54	0.034 - 0.2	1.366	0.039 U	0.021 JEB	0.038 U	0.036 JEB	0.014 JEB	0.012 JEB	0.055 EB	0.036 JEB
Fluorene	MG/KG	86-73-7	7 - 68	0.0019 - 0.022	0.007 - 0.21	0.011	0.039 U	0.039 U	0.038 U	0.04 U	0.02 J	0.039 U	0.044 U	0.022 J
Carbazole	MG/KG	86-74-8	10 - 68	0.0017 - 0.055	0.007 - 0.21	0.010	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.007 - 0.21		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Pentachlorophenol	MG/KG	87-86-5	0 - 68	-	0.036 - 5.4		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2,4,6-Trichlorophenol	MG/KG	88-06-2	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2-Nitroaniline	MG/KG	88-74-4	0 - 68	-	0.18 - 5.4		0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U	0.22 U	0.19 U
2-Nitrophenol	MG/KG	88-75-5	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
1-Methylnaphthalene	MG/KG	90-12-0	6 - 68	0.002 - 0.06	0.007 - 0.072	0.009	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Naphthalene	MG/KG	91-20-3	24 - 68	0.0014 - 0.54	0.007 - 0.21	0.022	0.093 U	0.094 U	0.091 U	0.095 U	0.086 U	0.095 U	0.11 U	0.091 U
2-Methylnaphthalene	MG/KG	91-57-6	7 - 68	0.0019 - 0.1	0.007 - 0.19	0.011	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2-Chloronaphthalene	MG/KG	91-58-7	0 - 68	-	0.007 - 0.21		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
3,3'-Dichlorobenzidine	MG/KG	91-94-1	0 - 68	-	0.034 - 1.1		0.078 U	0.078 U	0.076 U	0.079 U	0.072 U	0.079 U	0.088 U	0.076 U
Biphenyl	MG/KG	92-52-4	21 - 68	0.0017 - 14	0.034 - 1.1	0.312	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2-Methylphenol	MG/KG	95-48-7	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2-Chlorophenol	MG/KG	95-57-8	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
1,2,4,5-Tetrachlorobenzene	MG/KG	95-94-3	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
2,4,5-Trichlorophenol	MG/KG	95-95-4	0 - 68	-	0.034 - 1.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Acetophenone	MG/KG	98-86-2	6 - 68	0.0034 - 0.0083	0.036 - 2.1	0.075	0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
Nitrobenzene	MG/KG	98-95-3	0 - 68	-	0.036 - 2.1		0.039 U	0.039 U	0.038 U	0.04 U	0.036 U	0.039 U	0.044 U	0.038 U
3-Nitroaniline	MG/KG	99-09-2	0 - 68	-	0.18 - 5.4		0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	0.2 U	0.22 U	0.19 U
Volatile Organic Compounds														
Ethylbenzene	MG/KG	100-41-4	7 - 68	0.00027 - 0.37	0.002 - 1.9	0.030	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Styrene	MG/KG	100-42-5	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
cis-1,3-Dichloropropene	MG/KG	10061-01-5	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SS-422 OC-SS-422-0_0/1_0-XXX 9/15/2009 0- 1	SS-423 OC-SS-423-0_0/1_0-XXX 9/15/2009 0- 1	SS-424 OC-SS-424-0_0/1_0-XXX 9/15/2009 0- 1	SS-425 OC-SS-425-0_0/1_0-XXX 9/15/2009 0- 1	SS-426 OC-SS-426-0_0/1_0-XXX 9/16/2009 0- 1	SS-429 OC-SS-429-0_0/1_0-XXX 9/16/2009 0- 1	SS-430 OC-SS-430-0_0/1_0-XXX 9/16/2009 0- 1	SS-431 OC-SS-431-0_0/1_0-XXX 9/16/2009 0- 1
trans-1,3-Dichloropropene	MG/KG	10061-02-6	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Propylbenzene	MG/KG	103-65-1	3 - 68	0.00049 - 0.007	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
n-Butylbenzene	MG/KG	104-51-8	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
4-Chlorotoluene	MG/KG	106-43-4	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,4-Dichlorobenzene	MG/KG	106-46-7	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,2-Dibromoethane	MG/KG	106-93-4	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,2-Dichloroethane	MG/KG	107-06-2	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
2,4,4-Trimethyl-1-pentene	MG/KG	107-39-1	36 - 68	0.00076 - 8	0.004 - 1.2	0.179	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U	0.006 U	0.0045 U
2,4,4-Trimethyl-2-pentene	MG/KG	107-40-4	27 - 68	0.00056 - 6.3	0.004 - 1.2	0.143	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U	0.006 U	0.0045 U
4-Methyl-2-pentanone	MG/KG	108-10-1	0 - 68	-	0.018 - 9.3		0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U	0.03 U	0.023 U
Isopropyl ether	MG/KG	108-20-3	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,3,5-Trimethylbenzene	MG/KG	108-67-8	6 - 68	0.00037 - 0.0014	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Bromobenzene	MG/KG	108-86-1	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Methyl cyclohexane	MG/KG	108-87-2	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Toluene	MG/KG	108-88-3	10 - 68	0.00029 - 0.0042	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Chlorobenzene	MG/KG	108-90-7	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Tetrahydrofuran	MG/KG	109-99-9	0 - 68	-	0.023 - 19		0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U	0.03 U	0.023 U
Cyclohexane	MG/KG	110-82-7	0 - 68	-	0.018 - 9.3		0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U	0.03 U	0.023 U
1,2,4-Trichlorobenzene	MG/KG	120-82-1	10 - 68	0.00036 - 0.0025	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,4-Dioxane	MG/KG	123-91-1	0 - 68	-	0.18 - 93		0.29 UJ	0.24 UJ	0.25 UJ	0.24 UJ	0.24 UJ	0.33 UJ	0.3 UJ	0.23 UJ
Dibromochloromethane	MG/KG	124-48-1	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Tetrachloroethene	MG/KG	127-18-4	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Xylenes, Total	MG/KG	1330-20-7	7 - 68	0.00075 - 0.0026	0.004 - 1.9	0.032	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U	0.006 U	0.0045 U
sec-Butylbenzene	MG/KG	135-98-8	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,3-Dichloropropane	MG/KG	142-28-9	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
cis-1,2-Dichloroethene	MG/KG	156-59-2	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
trans-1,2-Dichloroethene	MG/KG	156-60-5	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Methyl Tertbutyl Ether	MG/KG	1634-04-4	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Xylenes (m&p)	MG/KG	179601-23-1	7 - 68	0.00075 - 0.0014	0.004 - 1.9	0.032	0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U	0.006 U	0.0045 U
1,3-Dichlorobenzene	MG/KG	541-73-1	2 - 68	0.00032 - 0.0004	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Carbon tetrachloride	MG/KG	56-23-5	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,1-Dichloropropene	MG/KG	563-58-6	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
2-Hexanone	MG/KG	591-78-6	0 - 68	-	0.018 - 9.3		0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U	0.03 U	0.023 U
2,2-Dichloropropane	MG/KG	594-20-7	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Diethyl ether	MG/KG	60-29-7	2 - 68	0.0028 - 0.0034	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,1,1,2-Tetrachloroethane	MG/KG	630-20-6	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Ethyl-t-Butyl Ether	MG/KG	637-92-3	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Acetone	MG/KG	67-64-1	38 - 68	0.0042 - 0.099	0.19 - 93	1.580	0.29 UJ	0.24 UJ	0.25 UJ	0.24 UJ	0.24 UJ	0.33 UJ	0.3 UJ	0.23 UJ
Chloroform	MG/KG	67-66-3	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Benzene	MG/KG	71-43-2	5 - 68	0.0002 - 0.0008	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,1,1-Trichloroethane	MG/KG	71-55-6	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Bromomethane	MG/KG	74-83-9	0 - 68	-	0.004 - 1.9		0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U	0.006 U	0.0045 U
Chloromethane	MG/KG	74-87-3	0 - 68	-	0.004 - 1.9		0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U	0.006 U	0.0045 U
Dibromomethane	MG/KG	74-95-3	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Bromochloromethane	MG/KG	74-97-5	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Chloroethane	MG/KG	75-00-3	0 - 68	-	0.004 - 1.9		0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U	0.006 U	0.0045 U
Vinyl chloride	MG/KG	75-01-4	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Methylene chloride	MG/KG	75-09-2	0 - 68	-	0.004 - 1.9		0.012 U	0.0096 U	0.0099 U	0.0095 U	0.0095 U	0.013 U	0.012 U	0.0091 U
Carbon disulfide	MG/KG	75-15-0	10 - 68	0.0024 - 0.0066	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Bromoform	MG/KG	75-25-2	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Bromodichloromethane	MG/KG	75-27-4	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,1-Dichloroethane	MG/KG	75-34-3	2 - 68	0.0007 - 0.0008	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,1-Dichloroethene	MG/KG	75-35-4	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Trichlorofluoromethane	MG/KG	75-69-4	0 - 68	-	0.004 - 1.9		0.0058 U	0.0048 U	0.0049 U	0.0048 U	0.0048 U	0.0065 U	0.006 U	0.0045 U
Dichlorodifluoromethane	MG/KG	75-71-8	0 - 68	-	0.004 - 1.9		0.0058 UJ	0.0048 UJ	0.0049 UJ	0.0048 UJ	0.0048 UJ	0.0065 UJ	0.006 UJ	0.0045 UJ
1,1,2-Trichloro-1,2,2-Trifluoroethane	MG/KG	76-13-1	0 - 68	-	0.004 - 1.9		0.014 U	0.012 U	0.012 U	0.012 U	0.012 U	0.016 U	0.015 U	0.011 U
1,2-Dichloropropane	MG/KG	78-87-5	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
2-Butanone	MG/KG	78-93-3	26 - 68	0.0044 - 0.56	0.018 - 9.3	0.173	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U	0.03 U	0.023 U
1,1,2-Trichloroethane	MG/KG	79-00-5	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Trichloroethene	MG/KG	79-01-6	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Acetic acid, methyl ester	MG/KG	79-20-9	4 - 68	0.0063 - 0.33	0.037 - 19	0.255	0.058 U	0.048 U	0.049 U	0.048 U	0.048 U	0.065 U	0.06 U	0.045 U
1,1,2,2-Tetrachloroethane	MG/KG	79-34-5	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U

Table A-3
Containment Area Soil Analytical Data (0-10FT BGS)
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Units	Casno	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits for Non-Detects	Average of All Samples	SS-422 OC-SS-422-0_0/1_0-XXX 9/15/2009 0- 1	SS-423 OC-SS-423-0_0/1_0-XXX 9/15/2009 0- 1	SS-424 OC-SS-424-0_0/1_0-XXX 9/15/2009 0- 1	SS-425 OC-SS-425-0_0/1_0-XXX 9/15/2009 0- 1	SS-426 OC-SS-426-0_0/1_0-XXX 9/16/2009 0- 1	SS-429 OC-SS-429-0_0/1_0-XXX 9/16/2009 0- 1	SS-430 OC-SS-430-0_0/1_0-XXX 9/16/2009 0- 1	SS-431 OC-SS-431-0_0/1_0-XXX 9/16/2009 0- 1
1,2,3-Trichlorobenzene	MG/KG	87-61-6	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Hexachlorobutadiene	MG/KG	87-68-3	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Naphthalene	MG/KG	91-20-3	8 - 68	0.0009 - 0.18	0.018 - 9.3	0.128	0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U	0.03 U	0.023 U
Xylene, o	MG/KG	95-47-6	2 - 68	0.00075 - 0.0016	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
2-Chlorotoluene	MG/KG	95-49-8	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,2-Dichlorobenzene	MG/KG	95-50-1	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,2,4-Trimethylbenzene	MG/KG	95-63-6	4 - 68	0.0027 - 0.016	0.002 - 1.9	0.032	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
1,2-Dibromo-3-chloropropane	MG/KG	96-12-8	0 - 68	-	0.018 - 9.3		0.029 U	0.024 U	0.025 U	0.024 U	0.024 U	0.033 U	0.03 U	0.023 U
1,2,3-Trichloropropane	MG/KG	96-18-4	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
tert-Butylbenzene	MG/KG	98-06-6	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Isopropylbenzene	MG/KG	98-82-8	4 - 68	0.0012 - 0.2	0.002 - 1.9	0.028	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Butane, 2-methoxy-2-methyl-	MG/KG	994-05-8	0 - 68	-	0.002 - 1.9		0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
4-iso-Propyltoluene	MG/KG	99-87-6	8 - 68	0.00041 - 0.42	0.002 - 1.9	0.031	0.0029 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0033 U	0.003 U	0.0023 U
Hydrazine/aldehydes														
Hydrazine	MG/KG	302-01-2	31 - 63	0.00062 - 0.086	0.002 - 0.007	0.005	0.0041		0.002 J			0.00062 J		0.0016 J
Formaldehyde	MG/KG	50-00-0	26 - 63	0.096 - 11	0.11 - 2.6	1.612	0.096 J		0.11 U			0.17		0.1 J
UDMH	MG/KG	57-14-7	0 - 63	-	0.005 - 0.007		0.0058 U		0.0058 U			0.006 U		0.0058 U
Monomethylhydrazine (MMH)	MG/KG	60-34-4	0 - 63	-	0.005 - 0.007		0.0058 U		0.0058 U			0.006 U		0.0058 U
Acetaldehyde	MG/KG	75-07-0	0 - 5	-	0.23 - 0.24		0.24 U		0.23 U			0.24 U		0.23 U

Prepared By: mjm 6/2/2020
Checked By: CF 6/3/2020

MG/KG = milligrams per kilogram
J - - estimated value biased low
J+ - estimated value biased high
U - indicates analyte not detected, number shown is the laboratory reporting limit
UJ - indicates analyte not detected, number shown is the estimated reporting limit

(1) Average of all samples calculated using detected concentrations and 1/2 the reporting limits for non-detects.

Attachment B

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/1/2020 1:15:22 PM
From File	0-2.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4-Chlorophenyl phenyl ether

General Statistics

Total Number of Observations	21	Number of Distinct Observations	12
Number of Detects	1	Number of Non-Detects	20
Number of Distinct Detects	1	Number of Distinct Non-Detects	11

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4-Chlorophenyl phenyl ether was not processed!

4-iso-Propyltoluene

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	2	Number of Non-Detects	19
Number of Distinct Detects	2	Number of Distinct Non-Detects	14
Minimum Detect	0.0013	Minimum Non-Detect	0.0023
Maximum Detect	0.0019	Maximum Non-Detect	0.0059
Variance Detects	1.8000E-7	Percent Non-Detects	90.48%
Mean Detects	0.0016	SD Detects	4.2426E-4
Median Detects	0.0016	CV Detects	0.265
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-6.456	SD of Logged Detects	0.268

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0016	KM Standard Error of Mean	3.0000E-4
KM SD	3.0000E-4	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.00212	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.00209	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0025	95% KM Chebyshev UCL	0.00291
97.5% KM Chebyshev UCL	0.00347	99% KM Chebyshev UCL	0.00458

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	28.11	k star (bias corrected MLE)	N/A
Theta hat (MLE)	5.6925E-5	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	112.4	nu star (bias corrected)	N/A
Mean (detects)	0.0016		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0016	SD (KM)	3.0000E-4
Variance (KM)	9.0000E-8	SE of Mean (KM)	3.0000E-4
k hat (KM)	28.44	k star (KM)	24.41
nu hat (KM)	1195	nu star (KM)	1025
theta hat (KM)	5.6250E-5	theta star (KM)	6.5540E-5
80% gamma percentile (KM)	0.00186	90% gamma percentile (KM)	0.00203
95% gamma percentile (KM)	0.00217	99% gamma percentile (KM)	0.00245

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (N/A, α)	952	Adjusted Chi Square Value (N/A, β)	946.6
95% Gamma Approximate KM-UCL (use when n>=50)	0.00172	95% Gamma Adjusted KM-UCL (use when n<50)	0.00173

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00159	Mean in Log Scale	-6.456
SD in Original Scale	2.4279E-4	SD in Log Scale	0.152
95% t UCL (assumes normality of ROS data)	0.00168	95% Percentile Bootstrap UCL	0.00167
95% BCA Bootstrap UCL	0.00168	95% Bootstrap t UCL	0.00169
95% H-UCL (Log ROS)	0.00169		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-6.456	KM Geo Mean	0.00157
KM SD (logged)	0.19	95% Critical H Value (KM-Log)	1.765
KM Standard Error of Mean (logged)	0.19	95% H-UCL (KM -Log)	0.00172
KM SD (logged)	0.19	95% Critical H Value (KM-Log)	1.765
KM Standard Error of Mean (logged)	0.19		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0018	Mean in Log Scale	-6.369
SD in Original Scale	5.5698E-4	SD in Log Scale	0.311
95% t UCL (Assumes normality)	0.002	95% H-Stat UCL	0.00205

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.00212	KM H-UCL	0.00172
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Warning: Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Ammonia

General Statistics			
Total Number of Observations	21	Number of Distinct Observations	20
Number of Detects	14	Number of Non-Detects	7
Number of Distinct Detects	14	Number of Distinct Non-Detects	6
Minimum Detect	3.8	Minimum Non-Detect	6.5
Maximum Detect	39	Maximum Non-Detect	8.4
Variance Detects	104.1	Percent Non-Detects	33.33%
Mean Detects	12.43	SD Detects	10.2
Median Detects	8.5	CV Detects	0.821
Skewness Detects	1.496	Kurtosis Detects	2.332
Mean of Logged Detects	2.234	SD of Logged Detects	0.778

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.825	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Normal at 5% Significance Level
Detected Data appear Approximate Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	9.875	KM Standard Error of Mean	2.006
KM SD	8.822	95% KM (BCA) UCL	13.22
95% KM (t) UCL	13.34	95% KM (Percentile Bootstrap) UCL	13.37
95% KM (z) UCL	13.18	95% KM Bootstrap t UCL	15.13
90% KM Chebyshev UCL	15.89	95% KM Chebyshev UCL	18.62
97.5% KM Chebyshev UCL	22.4	99% KM Chebyshev UCL	29.84

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.563	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.18	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.232	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.898	k star (bias corrected MLE)	1.539
Theta hat (MLE)	6.548	Theta star (bias corrected MLE)	8.075
nu hat (MLE)	53.15	nu star (bias corrected)	43.09
Mean (detects)	12.43		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	2.048	Mean	9.652
Maximum	39	Median	4.7
SD	9.185	CV	0.952
k hat (MLE)	1.693	k star (bias corrected MLE)	1.483
Theta hat (MLE)	5.701	Theta star (bias corrected MLE)	6.508
nu hat (MLE)	71.11	nu star (bias corrected)	62.29
Adjusted Level of Significance (β)	0.0383		
Approximate Chi Square Value (62.29, α)	45.13	Adjusted Chi Square Value (62.29, β)	44.01
95% Gamma Approximate UCL (use when n>=50)	13.32	95% Gamma Adjusted UCL (use when n<50)	13.66

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	9.875	SD (KM)	8.822
Variance (KM)	77.83	SE of Mean (KM)	2.006
k hat (KM)	1.253	k star (KM)	1.106
nu hat (KM)	52.62	nu star (KM)	46.44
theta hat (KM)	7.882	theta star (KM)	8.932
80% gamma percentile (KM)	15.76	90% gamma percentile (KM)	22.18
95% gamma percentile (KM)	28.56	99% gamma percentile (KM)	43.25

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (46.44, α)	31.8	Adjusted Chi Square Value (46.44, β)	30.87
95% Gamma Approximate KM-UCL (use when n>=50)	14.42	95% Gamma Adjusted KM-UCL (use when n<50)	14.85

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.168	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	10.02	Mean in Log Scale	2.037
SD in Original Scale	8.944	SD in Log Scale	0.694
95% t UCL (assumes normality of ROS data)	13.39	95% Percentile Bootstrap UCL	13.19
95% BCA Bootstrap UCL	14.15	95% Bootstrap t UCL	15.52
95% H-UCL (Log ROS)	13.69		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	2.003	KM Geo Mean	7.411
KM SD (logged)	0.703	95% Critical H Value (KM-Log)	2.194
KM Standard Error of Mean (logged)	0.163	95% H-UCL (KM -Log)	13.4
KM SD (logged)	0.703	95% Critical H Value (KM-Log)	2.194
KM Standard Error of Mean (logged)	0.163		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	9.538	Mean in Log Scale	1.93
SD in Original Scale	9.232	SD in Log Scale	0.768
95% t UCL (Assumes normality)	13.01	95% H-Stat UCL	13.65
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	13.34		

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Arsenic

General Statistics			
Total Number of Observations	21	Number of Distinct Observations	18
		Number of Missing Observations	0
Minimum	3.8	Mean	11.3
Maximum	33	Median	8.5
SD	6.729	Std. Error of Mean	1.468
Coefficient of Variation	0.596	Skewness	2.009

Normal GOF Test		
Shapiro Wilk Test Statistic	0.791	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.908	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.227	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.188	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	13.83	95% Adjusted-CLT UCL (Chen-1995)	14.4
		95% Modified-t UCL (Johnson-1978)	13.94

Gamma GOF Test		
A-D Test Statistic	0.763	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.208	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.19	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	3.997	k star (bias corrected MLE)	3.458
Theta hat (MLE)	2.826	Theta star (bias corrected MLE)	3.267
nu hat (MLE)	167.9	nu star (bias corrected)	145.2
MLE Mean (bias corrected)	11.3	MLE Sd (bias corrected)	6.074
		Approximate Chi Square Value (0.05)	118.4
Adjusted Level of Significance	0.0383	Adjusted Chi Square Value	116.5

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	13.86	95% Adjusted Gamma UCL (use when n<50)	14.08

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.908	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.183	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.188	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	1.335	Mean of logged Data	2.294
Maximum of Logged Data	3.497	SD of logged Data	0.502

Assuming Lognormal Distribution			
95% H-UCL	14.07	90% Chebyshev (MVUE) UCL	14.99
95% Chebyshev (MVUE) UCL	16.71	97.5% Chebyshev (MVUE) UCL	19.11
99% Chebyshev (MVUE) UCL	23.82		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	13.71	95% Jackknife UCL	13.83
95% Standard Bootstrap UCL	13.65	95% Bootstrap-t UCL	14.84
95% Hall's Bootstrap UCL	18.39	95% Percentile Bootstrap UCL	13.91
95% BCA Bootstrap UCL	14.44		
90% Chebyshev(Mean, Sd) UCL	15.7	95% Chebyshev(Mean, Sd) UCL	17.7
97.5% Chebyshev(Mean, Sd) UCL	20.47	99% Chebyshev(Mean, Sd) UCL	25.91

Suggested UCL to Use			
95% H-UCL	14.07		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Carbazole

General Statistics

Total Number of Observations	21	Number of Distinct Observations	17
Number of Detects	2	Number of Non-Detects	19
Number of Distinct Detects	2	Number of Distinct Non-Detects	15
Minimum Detect	0.0019	Minimum Non-Detect	0.0077
Maximum Detect	0.0035	Maximum Non-Detect	0.044
Variance Detects	1.2800E-6	Percent Non-Detects	90.48%
Mean Detects	0.0027	SD Detects	0.00113
Median Detects	0.0027	CV Detects	0.419
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-5.96	SD of Logged Detects	0.432

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0027	KM Standard Error of Mean	8.0000E-4
KM SD	8.0000E-4	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.00408	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.00402	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0051	95% KM Chebyshev UCL	0.00619
97.5% KM Chebyshev UCL	0.0077	99% KM Chebyshev UCL	0.0107

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	11.05	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.4441E-4	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	44.19	nu star (bias corrected)	N/A
Mean (detects)	0.0027		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0027	SD (KM)	8.0000E-4
Variance (KM)	6.4000E-7	SE of Mean (KM)	8.0000E-4
k hat (KM)	11.39	k star (KM)	9.795
nu hat (KM)	478.4	nu star (KM)	411.4
theta hat (KM)	2.3704E-4	theta star (KM)	2.7565E-4
80% gamma percentile (KM)	0.00339	90% gamma percentile (KM)	0.00385
95% gamma percentile (KM)	0.00426	99% gamma percentile (KM)	0.0051

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (411.40, α)	365.4	Adjusted Chi Square Value (411.40, β)	362.1
95% Gamma Approximate KM-UCL (use when n>=50)	0.00304	95% Gamma Adjusted KM-UCL (use when n<50)	0.00307

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00264	Mean in Log Scale	-5.96
SD in Original Scale	6.0445E-4	SD in Log Scale	0.226
95% t UCL (assumes normality of ROS data)	0.00287	95% Percentile Bootstrap UCL	0.00286
95% BCA Bootstrap UCL	0.00287	95% Bootstrap t UCL	0.00289
95% H-UCL (Log ROS)	0.00289		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.96	KM Geo Mean	0.00258
KM SD (logged)	0.305	95% Critical H Value (KM-Log)	1.837
KM Standard Error of Mean (logged)	0.305	95% H-UCL (KM -Log)	0.00306
KM SD (logged)	0.305	95% Critical H Value (KM-Log)	1.837
KM Standard Error of Mean (logged)	0.305		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0131	Mean in Log Scale	-4.595
SD in Original Scale	0.00766	SD in Log Scale	0.817
95% t UCL (Assumes normality)	0.0159	95% H-Stat UCL	0.0216

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.00408	KM H-UCL	0.00306
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Warning: Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chloride

General Statistics			
Total Number of Observations	21	Number of Distinct Observations	15
Number of Detects	5	Number of Non-Detects	16
Number of Distinct Detects	5	Number of Distinct Non-Detects	10
Minimum Detect	4.7	Minimum Non-Detect	11
Maximum Detect	44	Maximum Non-Detect	25
Variance Detects	289.9	Percent Non-Detects	76.19%
Mean Detects	13.72	SD Detects	17.03
Median Detects	5.4	CV Detects	1.241
Skewness Detects	2.174	Kurtosis Detects	4.758
Mean of Logged Detects	2.179	SD of Logged Detects	0.936

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.634	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.402	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level
Detected Data Not Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	7.952	KM Standard Error of Mean	2.196
KM SD	8.257	95% KM (BCA) UCL	12.54
95% KM (t) UCL	11.74	95% KM (Percentile Bootstrap) UCL	11.66
95% KM (z) UCL	11.56	95% KM Bootstrap t UCL	49.54
90% KM Chebyshev UCL	14.54	95% KM Chebyshev UCL	17.53
97.5% KM Chebyshev UCL	21.67	99% KM Chebyshev UCL	29.8

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.842	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.689	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.343	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance Level
Detected data follow Appr. Gamma Distribution at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.279	k star (bias corrected MLE)	0.645
Theta hat (MLE)	10.73	Theta star (bias corrected MLE)	21.28
nu hat (MLE)	12.79	nu star (bias corrected)	6.448
Mean (detects)	13.72		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	8.044
Maximum	44	Median	5.8
SD	8.978	CV	1.116
k hat (MLE)	1.036	k star (bias corrected MLE)	0.919
Theta hat (MLE)	7.768	Theta star (bias corrected MLE)	8.749
nu hat (MLE)	43.49	nu star (bias corrected)	38.61
Adjusted Level of Significance (β)	0.0383		
Approximate Chi Square Value (38.61, α)	25.38	Adjusted Chi Square Value (38.61, β)	24.56
95% Gamma Approximate UCL (use when n>=50)	12.24	95% Gamma Adjusted UCL (use when n<50)	12.65

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	7.952	SD (KM)	8.257
Variance (KM)	68.18	SE of Mean (KM)	2.196
k hat (KM)	0.928	k star (KM)	0.827
nu hat (KM)	38.96	nu star (KM)	34.72
theta hat (KM)	8.574	theta star (KM)	9.619
80% gamma percentile (KM)	12.97	90% gamma percentile (KM)	19.18
95% gamma percentile (KM)	25.49	99% gamma percentile (KM)	40.36

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (34.72, α)	22.24	Adjusted Chi Square Value (34.72, β)	21.48
95% Gamma Approximate KM-UCL (use when n>=50)	12.41	95% Gamma Adjusted KM-UCL (use when n<50)	12.86

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.756	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.301	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Approximate Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	8.381	Mean in Log Scale	1.931
SD in Original Scale	8.435	SD in Log Scale	0.527
95% t UCL (assumes normality of ROS data)	11.56	95% Percentile Bootstrap UCL	11.84
95% BCA Bootstrap UCL	13.71	95% Bootstrap t UCL	19.63
95% H-UCL (Log ROS)	10.05		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.874	KM Geo Mean	6.512
KM SD (logged)	0.5	95% Critical H Value (KM-Log)	1.989
KM Standard Error of Mean (logged)	0.176	95% H-UCL (KM -Log)	9.215
KM SD (logged)	0.5	95% Critical H Value (KM-Log)	1.989
KM Standard Error of Mean (logged)	0.176		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	9.457	Mean in Log Scale	2.084
SD in Original Scale	8.263	SD in Log Scale	0.494
95% t UCL (Assumes normality)	12.57	95% H-Stat UCL	11.3
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Gamma Distributed at 5% Significance Level			

Suggested UCL to Use			
a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	12.86		

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Nickel

General Statistics			
Total Number of Observations	21	Number of Distinct Observations	17
		Number of Missing Observations	0
Minimum	6.1	Mean	9.5
Maximum	18	Median	8.9
SD	2.675	Std. Error of Mean	0.584
Coefficient of Variation	0.282	Skewness	1.989

Normal GOF Test		
Shapiro Wilk Test Statistic	0.791	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.908	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.283	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.188	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	10.51	95% Adjusted-CLT UCL (Chen-1995)	10.73
		95% Modified-t UCL (Johnson-1978)	10.55

Gamma GOF Test		
A-D Test Statistic	0.982	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.243	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.189	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	16.31	k star (bias corrected MLE)	14.02
Theta hat (MLE)	0.582	Theta star (bias corrected MLE)	0.678
nu hat (MLE)	685.2	nu star (bias corrected)	588.6
MLE Mean (bias corrected)	9.5	MLE Sd (bias corrected)	2.538
		Approximate Chi Square Value (0.05)	533.4
Adjusted Level of Significance	0.0383	Adjusted Chi Square Value	529.3

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	10.48	95% Adjusted Gamma UCL (use when n<50)	10.56

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.899	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.908	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.226	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.188	Data Not Lognormal at 5% Significance Level
Data Not Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	1.808	Mean of logged Data	2.22
Maximum of Logged Data	2.89	SD of logged Data	0.245

Assuming Lognormal Distribution			
95% H-UCL	10.47	90% Chebyshev (MVUE) UCL	11.01
95% Chebyshev (MVUE) UCL	11.7	97.5% Chebyshev (MVUE) UCL	12.67
99% Chebyshev (MVUE) UCL	14.56		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs			
95% CLT UCL	10.46	95% Jackknife UCL	10.51
95% Standard Bootstrap UCL	10.42	95% Bootstrap-t UCL	11.29
95% Hall's Bootstrap UCL	16.28	95% Percentile Bootstrap UCL	10.51
95% BCA Bootstrap UCL	10.75		
90% Chebyshev(Mean, Sd) UCL	11.25	95% Chebyshev(Mean, Sd) UCL	12.04
97.5% Chebyshev(Mean, Sd) UCL	13.15	99% Chebyshev(Mean, Sd) UCL	15.31

Suggested UCL to Use			
95% Student's-t UCL	10.51	or 95% Modified-t UCL	10.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Sulfate

General Statistics			
Total Number of Observations	21	Number of Distinct Observations	19
		Number of Missing Observations	0
Minimum	57	Mean	4380
Maximum	18000	Median	1300
SD	5860	Std. Error of Mean	1279
Coefficient of Variation	1.338	Skewness	1.529

Normal GOF Test		
Shapiro Wilk Test Statistic	0.722	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.908	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.299	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.188	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	6586	95% Adjusted-CLT UCL (Chen-1995)	6939
		95% Modified-t UCL (Johnson-1978)	6657

Gamma GOF Test		
A-D Test Statistic	0.54	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.796	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.157	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.199	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	0.602	k star (bias corrected MLE)	0.548
Theta hat (MLE)	7271	Theta star (bias corrected MLE)	7992
nu hat (MLE)	25.3	nu star (bias corrected)	23.02
MLE Mean (bias corrected)	4380	MLE Sd (bias corrected)	5917
		Approximate Chi Square Value (0.05)	13.11
Adjusted Level of Significance	0.0383	Adjusted Chi Square Value	12.53

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	7694	95% Adjusted Gamma UCL (use when n<50)	8046

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.908	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0939	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.188	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	4.043	Mean of logged Data	7.36
Maximum of Logged Data	9.798	SD of logged Data	1.66

Assuming Lognormal Distribution			
95% H-UCL	23458	90% Chebyshev (MVUE) UCL	12695
95% Chebyshev (MVUE) UCL	15977	97.5% Chebyshev (MVUE) UCL	20532
99% Chebyshev (MVUE) UCL	29480		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	6483	95% Jackknife UCL	6586
95% Standard Bootstrap UCL	6425	95% Bootstrap-t UCL	7769
95% Hall's Bootstrap UCL	6638	95% Percentile Bootstrap UCL	6672
95% BCA Bootstrap UCL	6998		
90% Chebyshev(Mean, Sd) UCL	8216	95% Chebyshev(Mean, Sd) UCL	9954
97.5% Chebyshev(Mean, Sd) UCL	12366	99% Chebyshev(Mean, Sd) UCL	17103

Suggested UCL to Use			
95% Adjusted Gamma UCL	8046		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/28/2020 5:01:25 PM
From File	proucl input 2-10.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Ammonia

General Statistics

Total Number of Observations	47	Number of Distinct Observations	35
		Number of Missing Observations	12
Number of Detects	45	Number of Non-Detects	2
Number of Distinct Detects	34	Number of Distinct Non-Detects	2
Minimum Detect	3.5	Minimum Non-Detect	6.6
Maximum Detect	58	Maximum Non-Detect	9.9
Variance Detects	199.6	Percent Non-Detects	4.255%
Mean Detects	17.77	SD Detects	14.13
Median Detects	12	CV Detects	0.795
Skewness Detects	1.35	Kurtosis Detects	0.768
Mean of Logged Detects	2.608	SD of Logged Detects	0.728

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.804	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.244	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.131	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	17.27	KM Standard Error of Mean	2.048
KM SD	13.88	95% KM (BCA) UCL	20.7
95% KM (t) UCL	20.7	95% KM (Percentile Bootstrap) UCL	20.81
95% KM (z) UCL	20.63	95% KM Bootstrap t UCL	21.21
90% KM Chebyshev UCL	23.41	95% KM Chebyshev UCL	26.19
97.5% KM Chebyshev UCL	30.06	99% KM Chebyshev UCL	37.64

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.386	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.76	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.164	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.133	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.008	k star (bias corrected MLE)	1.889
Theta hat (MLE)	8.848	Theta star (bias corrected MLE)	9.405
nu hat (MLE)	180.7	nu star (bias corrected)	170
Mean (detects)	17.77		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	1.669	Mean	17.15
Maximum	58	Median	12
SD	14.14	CV	0.824
k hat (MLE)	1.814	k star (bias corrected MLE)	1.712
Theta hat (MLE)	9.455	Theta star (bias corrected MLE)	10.02
nu hat (MLE)	170.5	nu star (bias corrected)	161
Adjusted Level of Significance (β)	0.0449		
Approximate Chi Square Value (160.96, α)	132.6	Adjusted Chi Square Value (160.96, β)	131.8
95% Gamma Approximate UCL (use when n>=50)	20.81	95% Gamma Adjusted UCL (use when n<50)	20.94

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	17.27	SD (KM)	13.88
Variance (KM)	192.7	SE of Mean (KM)	2.048
k hat (KM)	1.547	k star (KM)	1.463
nu hat (KM)	145.5	nu star (KM)	137.5
theta hat (KM)	11.16	theta star (KM)	11.8
80% gamma percentile (KM)	26.79	90% gamma percentile (KM)	36.2
95% gamma percentile (KM)	45.36	99% gamma percentile (KM)	66.07

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (137.50, α)	111.4	Adjusted Chi Square Value (137.50, β)	110.7
95% Gamma Approximate KM-UCL (use when n>=50)	21.31	95% Gamma Adjusted KM-UCL (use when n<50)	21.45

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.945	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.112	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.131	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	17.25	Mean in Log Scale	2.571
SD in Original Scale	14.04	SD in Log Scale	0.736
95% t UCL (assumes normality of ROS data)	20.69	95% Percentile Bootstrap UCL	20.71
95% BCA Bootstrap UCL	21.13	95% Bootstrap t UCL	21.45
95% H-UCL (Log ROS)	21.44		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.572	KM Geo Mean	13.09
KM SD (logged)	0.728	95% Critical H Value (KM-Log)	2.058
KM Standard Error of Mean (logged)	0.108	95% H-UCL (KM -Log)	21.28
KM SD (logged)	0.728	95% Critical H Value (KM-Log)	2.058
KM Standard Error of Mean (logged)	0.108		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	17.19	Mean in Log Scale	2.557
SD in Original Scale	14.1	SD in Log Scale	0.755
95% t UCL (Assumes normality)	20.64	95% H-Stat UCL	21.62

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	21.28		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Arsenic

General Statistics			
Total Number of Observations	47	Number of Distinct Observations	44
		Number of Missing Observations	12
Minimum	0.76	Mean	7.206
Maximum	29	Median	6.2
SD	5.663	Std. Error of Mean	0.826
Coefficient of Variation	0.786	Skewness	2.168

Normal GOF Test		
Shapiro Wilk Test Statistic	0.798	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.946	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.128	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	8.592	95% Adjusted-CLT UCL (Chen-1995)	8.844
		95% Modified-t UCL (Johnson-1978)	8.636

Gamma GOF Test		
A-D Test Statistic	0.365	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.761	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.109	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.131	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	2.074	k star (bias corrected MLE)	1.956
Theta hat (MLE)	3.474	Theta star (bias corrected MLE)	3.684
nu hat (MLE)	194.9	nu star (bias corrected)	183.8
MLE Mean (bias corrected)	7.206	MLE Sd (bias corrected)	5.153
		Approximate Chi Square Value (0.05)	153.5
Adjusted Level of Significance	0.0449	Adjusted Chi Square Value	152.6

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	8.631	95% Adjusted Gamma UCL (use when n<50)	8.681

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.976	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.946	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0808	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.128	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	-0.274	Mean of logged Data	1.715
Maximum of Logged Data	3.367	SD of logged Data	0.756

Assuming Lognormal Distribution			
95% H-UCL	9.332	90% Chebyshev (MVUE) UCL	10.03
95% Chebyshev (MVUE) UCL	11.25	97.5% Chebyshev (MVUE) UCL	12.94
99% Chebyshev (MVUE) UCL	16.26		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	8.564	95% Jackknife UCL	8.592
95% Standard Bootstrap UCL	8.549	95% Bootstrap-t UCL	9.161
95% Hall's Bootstrap UCL	9.248	95% Percentile Bootstrap UCL	8.631
95% BCA Bootstrap UCL	8.853		
90% Chebyshev(Mean, Sd) UCL	9.684	95% Chebyshev(Mean, Sd) UCL	10.81
97.5% Chebyshev(Mean, Sd) UCL	12.36	99% Chebyshev(Mean, Sd) UCL	15.42

Suggested UCL to Use			
95% Adjusted Gamma UCL	8.681		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Manganese

General Statistics			
Total Number of Observations	47	Number of Distinct Observations	31
		Number of Missing Observations	12
Minimum	31	Mean	117.4
Maximum	310	Median	120
SD	64.83	Std. Error of Mean	9.456
Coefficient of Variation	0.552	Skewness	0.762

Normal GOF Test		
Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.946	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.116	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.128	Data appear Normal at 5% Significance Level
Data appear Approximate Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	133.3	95% Adjusted-CLT UCL (Chen-1995)	134.1
		95% Modified-t UCL (Johnson-1978)	133.4

Gamma GOF Test		
A-D Test Statistic	0.691	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0993	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.13	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	3.313	k star (bias corrected MLE)	3.115
Theta hat (MLE)	35.44	Theta star (bias corrected MLE)	37.68
nu hat (MLE)	311.4	nu star (bias corrected)	292.8
MLE Mean (bias corrected)	117.4	MLE Sd (bias corrected)	66.5
		Approximate Chi Square Value (0.05)	254.2
Adjusted Level of Significance	0.0449	Adjusted Chi Square Value	253.1

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	135.2	95% Adjusted Gamma UCL (use when n<50)	135.8

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.947	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.946	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.132	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.128	Data Not Lognormal at 5% Significance Level
Data appear Approximate Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	3.434	Mean of logged Data	4.607
Maximum of Logged Data	5.737	SD of logged Data	0.586

Assuming Lognormal Distribution			
95% H-UCL	140.7	90% Chebyshev (MVUE) UCL	150.8
95% Chebyshev (MVUE) UCL	165.5	97.5% Chebyshev (MVUE) UCL	185.9
99% Chebyshev (MVUE) UCL	225.9		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	132.9	95% Jackknife UCL	133.3
95% Standard Bootstrap UCL	132.9	95% Bootstrap-t UCL	134.4
95% Hall's Bootstrap UCL	134.9	95% Percentile Bootstrap UCL	133.2
95% BCA Bootstrap UCL	133.2		
90% Chebyshev(Mean, Sd) UCL	145.8	95% Chebyshev(Mean, Sd) UCL	158.6
97.5% Chebyshev(Mean, Sd) UCL	176.4	99% Chebyshev(Mean, Sd) UCL	211.5

Suggested UCL to Use			
95% Student's-t UCL	133.3		

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

4-iso-Propyltoluene

General Statistics			
Total Number of Observations	47	Number of Distinct Observations	23
		Number of Missing Observations	12
Number of Detects	6	Number of Non-Detects	41
Number of Distinct Detects	6	Number of Distinct Non-Detects	17
Minimum Detect	4.1000E-4	Minimum Non-Detect	0.0037
Maximum Detect	0.42	Maximum Non-Detect	1.9
Variance Detects	0.0293	Percent Non-Detects	87.23%
Mean Detects	0.0705	SD Detects	0.171
Median Detects	5.0000E-4	CV Detects	2.428
Skewness Detects	2.449	Kurtosis Detects	6
Mean of Logged Detects	-6.384	SD of Logged Detects	2.73

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.498	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.491	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.00993	KM Standard Error of Mean	0.0101
KM SD	0.0618	95% KM (BCA) UCL	0.0286
95% KM (t) UCL	0.0269	95% KM (Percentile Bootstrap) UCL	0.0291
95% KM (z) UCL	0.0265	95% KM Bootstrap t UCL	5.754
90% KM Chebyshev UCL	0.0402	95% KM Chebyshev UCL	0.0539
97.5% KM Chebyshev UCL	0.073	99% KM Chebyshev UCL	0.11

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.479	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.804	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.48	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.364	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.198	k star (bias corrected MLE)	0.21
Theta hat (MLE)	0.357	Theta star (bias corrected MLE)	0.336
nu hat (MLE)	2.371	nu star (bias corrected)	2.519
Mean (detects)	0.0705		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	4.1000E-4	Mean	0.0211
Maximum	0.42	Median	0.01
SD	0.0605	CV	2.862
k hat (MLE)	0.728	k star (bias corrected MLE)	0.696
Theta hat (MLE)	0.029	Theta star (bias corrected MLE)	0.0304
nu hat (MLE)	68.45	nu star (bias corrected)	65.41
Adjusted Level of Significance (β)	0.0449		
Approximate Chi Square Value (65.41, α)	47.8	Adjusted Chi Square Value (65.41, β)	47.33
95% Gamma Approximate UCL (use when n>=50)	0.0289	95% Gamma Adjusted UCL (use when n<50)	0.0292

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.00993	SD (KM)	0.0618
Variance (KM)	0.00382	SE of Mean (KM)	0.0101
k hat (KM)	0.0258	k star (KM)	0.0383
nu hat (KM)	2.426	nu star (KM)	3.605
theta hat (KM)	0.385	theta star (KM)	0.259
80% gamma percentile (KM)	4.4624E-4	90% gamma percentile (KM)	0.00997
95% gamma percentile (KM)	0.0465	99% gamma percentile (KM)	0.238

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.60, α)	0.572	Adjusted Chi Square Value (3.60, β)	0.538
95% Gamma Approximate KM-UCL (use when n>=50)	0.0626	95% Gamma Adjusted KM-UCL (use when n<50)	0.0666
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.603	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.383	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.0102	Mean in Log Scale	-7.085
SD in Original Scale	0.0611	SD in Log Scale	1.417
95% t UCL (assumes normality of ROS data)	0.0251	95% Percentile Bootstrap UCL	0.028
95% BCA Bootstrap UCL	0.0455	95% Bootstrap t UCL	0.482
95% H-UCL (Log ROS)	0.00412		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-7.34	KM Geo Mean	6.4918E-4
KM SD (logged)	1.049	95% Critical H Value (KM-Log)	2.383
KM Standard Error of Mean (logged)	0.245	95% H-UCL (KM -Log)	0.00163
KM SD (logged)	1.049	95% Critical H Value (KM-Log)	2.383
KM Standard Error of Mean (logged)	0.245		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0438	Mean in Log Scale	-5.925
SD in Original Scale	0.171	SD in Log Scale	1.509
95% t UCL (Assumes normality)	0.0857	95% H-Stat UCL	0.016
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use			
97.5% KM (Chebyshev) UCL	0.073		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/27/2020 9:16:31 AM
From File	0-10FT.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4-Bromophenyl phenyl ether

General Statistics

Total Number of Observations	68	Number of Distinct Observations	21
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	67
Number of Distinct Detects	1	Number of Distinct Non-Detects	20

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4-Bromophenyl phenyl ether was not processed!

4-Chlorophenyl phenyl ether

General Statistics

Total Number of Observations	68	Number of Distinct Observations	22
		Number of Missing Observations	1
Number of Detects	2	Number of Non-Detects	66
Number of Distinct Detects	2	Number of Distinct Non-Detects	20
Minimum Detect	0.0064	Minimum Non-Detect	0.034
Maximum Detect	0.031	Maximum Non-Detect	1.1
Variance Detects	3.0258E-4	Percent Non-Detects	97.06%
Mean Detects	0.0187	SD Detects	0.0174
Median Detects	0.0187	CV Detects	0.93
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-4.263	SD of Logged Detects	1.116

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0187	KM Standard Error of Mean	0.0123
KM SD	0.0123	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0392	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0389	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0556	95% KM Chebyshev UCL	0.0723
97.5% KM Chebyshev UCL	0.0955	99% KM Chebyshev UCL	0.141

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.914	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00977	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.657	nu star (bias corrected)	N/A
Mean (detects)	0.0187		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0187	SD (KM)	0.0123
Variance (KM)	1.5129E-4	SE of Mean (KM)	0.0123
k hat (KM)	2.311	k star (KM)	2.219
nu hat (KM)	314.3	nu star (KM)	301.8
theta hat (KM)	0.00809	theta star (KM)	0.00843
80% gamma percentile (KM)	0.0277	90% gamma percentile (KM)	0.0355
95% gamma percentile (KM)	0.0429	99% gamma percentile (KM)	0.0593

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0465
Approximate Chi Square Value (301.81, α)	262.6	Adjusted Chi Square Value (301.81, β)	261.8
95% Gamma Approximate KM-UCL (use when n>=50)	0.0215	95% Gamma Adjusted KM-UCL (use when n<50)	0.0216

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0277	Mean in Log Scale	-4.263
SD in Original Scale	0.0367	SD in Log Scale	1.202
95% t UCL (assumes normality of ROS data)	0.0351	95% Percentile Bootstrap UCL	0.0347
95% BCA Bootstrap UCL	0.037	95% Bootstrap t UCL	0.0377
95% H-UCL (Log ROS)	0.0399		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.263	KM Geo Mean	0.0141
KM SD (logged)	0.789	95% Critical H Value (KM-Log)	2.091
KM Standard Error of Mean (logged)	0.789	95% H-UCL (KM -Log)	0.0235
KM SD (logged)	0.789	95% Critical H Value (KM-Log)	2.091
KM Standard Error of Mean (logged)	0.789		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0402	Mean in Log Scale	-3.718
SD in Original Scale	0.0852	SD in Log Scale	0.711
95% t UCL (Assumes normality)	0.0574	95% H-Stat UCL	0.0373

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	0.0723		

Warning: Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

4-iso-Propyltoluene

General Statistics			
Total Number of Observations	68	Number of Distinct Observations	32
		Number of Missing Observations	1
Number of Detects	8	Number of Non-Detects	60
Number of Distinct Detects	8	Number of Distinct Non-Detects	24
Minimum Detect	4.1000E-4	Minimum Non-Detect	0.0023
Maximum Detect	0.42	Maximum Non-Detect	1.9
Variance Detects	0.022	Percent Non-Detects	88.24%
Mean Detects	0.0533	SD Detects	0.148
Median Detects	8.6000E-4	CV Detects	2.781
Skewness Detects	2.828	Kurtosis Detects	8
Mean of Logged Detects	-6.402	SD of Logged Detects	2.31

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.422	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.511	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.00724	KM Standard Error of Mean	0.00674
KM SD	0.0512	95% KM (BCA) UCL	0.0205
95% KM (t) UCL	0.0185	95% KM (Percentile Bootstrap) UCL	0.0199
95% KM (z) UCL	0.0183	95% KM Bootstrap t UCL	0.323
90% KM Chebyshev UCL	0.0275	95% KM Chebyshev UCL	0.0366
97.5% KM Chebyshev UCL	0.0493	99% KM Chebyshev UCL	0.0743

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.973	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.832	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.485	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.322	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.21	k star (bias corrected MLE)	0.215
Theta hat (MLE)	0.253	Theta star (bias corrected MLE)	0.248
nu hat (MLE)	3.367	nu star (bias corrected)	3.438
Mean (detects)	0.0533		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	4.1000E-4	Mean	0.0181
Maximum	0.42	Median	0.01
SD	0.0505	CV	2.785
k hat (MLE)	0.883	k star (bias corrected MLE)	0.854
Theta hat (MLE)	0.0205	Theta star (bias corrected MLE)	0.0212
nu hat (MLE)	120.1	nu star (bias corrected)	116.2
Adjusted Level of Significance (β)	0.0465		
Approximate Chi Square Value (116.15, α)	92.27	Adjusted Chi Square Value (116.15, β)	91.81
95% Gamma Approximate UCL (use when n>=50)	0.0228	95% Gamma Adjusted UCL (use when n<50)	0.0229

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.00724	SD (KM)	0.0512
Variance (KM)	0.00262	SE of Mean (KM)	0.00674
k hat (KM)	0.02	k star (KM)	0.0289
nu hat (KM)	2.723	nu star (KM)	3.936
theta hat (KM)	0.362	theta star (KM)	0.25
80% gamma percentile (KM)	6.4509E-5	90% gamma percentile (KM)	0.00383
95% gamma percentile (KM)	0.0271	99% gamma percentile (KM)	0.189

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.94, α)	0.697	Adjusted Chi Square Value (3.94, β)	0.669
95% Gamma Approximate KM-UCL (use when n>=50)	0.0409	95% Gamma Adjusted KM-UCL (use when n<50)	0.0426

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.635	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.352	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.00762	Mean in Log Scale	-6.893
SD in Original Scale	0.0508	SD in Log Scale	1.224
95% t UCL (assumes normality of ROS data)	0.0179	95% Percentile Bootstrap UCL	0.0199
95% BCA Bootstrap UCL	0.0265	95% Bootstrap t UCL	0.273
95% H-UCL (Log ROS)	0.00296		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-7.096	KM Geo Mean	8.2806E-4
KM SD (logged)	0.963	95% Critical H Value (KM-Log)	2.234
KM Standard Error of Mean (logged)	0.252	95% H-UCL (KM -Log)	0.00171
KM SD (logged)	0.963	95% Critical H Value (KM-Log)	2.234
KM Standard Error of Mean (logged)	0.252		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0308	Mean in Log Scale	-6.062
SD in Original Scale	0.143	SD in Log Scale	1.278
95% t UCL (Assumes normality)	0.0598	95% H-Stat UCL	0.00735
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use			
95% KM (Chebyshev) UCL	0.0366		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Ammonia

General Statistics			
Total Number of Observations	68	Number of Distinct Observations	47
		Number of Missing Observations	1
Number of Detects	59	Number of Non-Detects	9
Number of Distinct Detects	43	Number of Distinct Non-Detects	8
Minimum Detect	3.5	Minimum Non-Detect	6.5
Maximum Detect	58	Maximum Non-Detect	9.9
Variance Detects	180	Percent Non-Detects	13.24%
Mean Detects	16.5	SD Detects	13.42
Median Detects	12	CV Detects	0.813
Skewness Detects	1.432	Kurtosis Detects	1.197
Mean of Logged Detects	2.519	SD of Logged Detects	0.751

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.808	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	4.413E-10	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.222	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.115	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	15.02	KM Standard Error of Mean	1.588
KM SD	12.97	95% KM (BCA) UCL	17.96
95% KM (t) UCL	17.66	95% KM (Percentile Bootstrap) UCL	17.66
95% KM (z) UCL	17.63	95% KM Bootstrap t UCL	18.05
90% KM Chebyshev UCL	19.78	95% KM Chebyshev UCL	21.94
97.5% KM Chebyshev UCL	24.93	99% KM Chebyshev UCL	30.81

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.26	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.764	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.132	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.117	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.91	k star (bias corrected MLE)	1.825
Theta hat (MLE)	8.637	Theta star (bias corrected MLE)	9.043
nu hat (MLE)	225.4	nu star (bias corrected)	215.3
Mean (detects)	16.5		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.99	Mean	14.7
Maximum	58	Median	10
SD	13.33	CV	0.907
k hat (MLE)	1.483	k star (bias corrected MLE)	1.428
Theta hat (MLE)	9.909	Theta star (bias corrected MLE)	10.3
nu hat (MLE)	201.8	nu star (bias corrected)	194.2
Adjusted Level of Significance (β)	0.0465		
Approximate Chi Square Value (194.18, α)	162.9	Adjusted Chi Square Value (194.18, β)	162.3
95% Gamma Approximate UCL (use when n>=50)	17.52	95% Gamma Adjusted UCL (use when n<50)	17.58

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	15.02	SD (KM)	12.97
Variance (KM)	168.2	SE of Mean (KM)	1.588
k hat (KM)	1.34	k star (KM)	1.291
nu hat (KM)	182.3	nu star (KM)	175.6
theta hat (KM)	11.2	theta star (KM)	11.63
80% gamma percentile (KM)	23.6	90% gamma percentile (KM)	32.46
95% gamma percentile (KM)	41.15	99% gamma percentile (KM)	60.98

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (175.56, α)	145.9	Adjusted Chi Square Value (175.56, β)	145.3
95% Gamma Approximate KM-UCL (use when n>=50)	18.07	95% Gamma Adjusted KM-UCL (use when n<50)	18.14

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.952	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0.045	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0787	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.115	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Approximate Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	15.02	Mean in Log Scale	2.405
SD in Original Scale	13.06	SD in Log Scale	0.759
95% t UCL (assumes normality of ROS data)	17.66	95% Percentile Bootstrap UCL	17.58
95% BCA Bootstrap UCL	18.05	95% Bootstrap t UCL	18.1
95% H-UCL (Log ROS)	17.91		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	2.402	KM Geo Mean	11.05
KM SD (logged)	0.761	95% Critical H Value (KM-Log)	2.067
KM Standard Error of Mean (logged)	0.094	95% H-UCL (KM -Log)	17.89
KM SD (logged)	0.761	95% Critical H Value (KM-Log)	2.067
KM Standard Error of Mean (logged)	0.094		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	14.82	Mean in Log Scale	2.363
SD in Original Scale	13.21	SD in Log Scale	0.808
95% t UCL (Assumes normality)	17.5	95% H-Stat UCL	18.13
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use			
KM H-UCL	17.89		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Arsenic

General Statistics			
Total Number of Observations	68	Number of Distinct Observations	54
		Number of Missing Observations	1
Minimum	0.76	Mean	8.469
Maximum	33	Median	7.5
SD	6.258	Std. Error of Mean	0.759
Coefficient of Variation	0.739	Skewness	1.938

Normal GOF Test		
Shapiro Wilk Test Statistic	0.823	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	5.195E-11	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.183	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.107	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	9.734	95% Adjusted-CLT UCL (Chen-1995)	9.907
		95% Modified-t UCL (Johnson-1978)	9.764

Gamma GOF Test		
A-D Test Statistic	0.557	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.762	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.093	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.109	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	2.213	k star (bias corrected MLE)	2.125
Theta hat (MLE)	3.827	Theta star (bias corrected MLE)	3.985
nu hat (MLE)	300.9	nu star (bias corrected)	289
MLE Mean (bias corrected)	8.469	MLE Sd (bias corrected)	5.809
		Approximate Chi Square Value (0.05)	250.6
Adjusted Level of Significance	0.0465	Adjusted Chi Square Value	249.9

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	9.765	95% Adjusted Gamma UCL (use when n<50)	9.795

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0.238	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0871	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.107	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	-0.274	Mean of logged Data	1.894
Maximum of Logged Data	3.497	SD of logged Data	0.735

Assuming Lognormal Distribution			
95% H-UCL	10.46	90% Chebyshev (MVUE) UCL	11.23
95% Chebyshev (MVUE) UCL	12.4	97.5% Chebyshev (MVUE) UCL	14.02
99% Chebyshev (MVUE) UCL	17.19		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	9.717	95% Jackknife UCL	9.734
95% Standard Bootstrap UCL	9.705	95% Bootstrap-t UCL	9.99
95% Hall's Bootstrap UCL	10.04	95% Percentile Bootstrap UCL	9.704
95% BCA Bootstrap UCL	9.952		
90% Chebyshev(Mean, Sd) UCL	10.75	95% Chebyshev(Mean, Sd) UCL	11.78
97.5% Chebyshev(Mean, Sd) UCL	13.21	99% Chebyshev(Mean, Sd) UCL	16.02

Suggested UCL to Use			
95% Approximate Gamma UCL	9.765		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Bis(2-Ethylhexyl)phthalate

General Statistics			
Total Number of Observations	68	Number of Distinct Observations	53
		Number of Missing Observations	1
Number of Detects	54	Number of Non-Detects	14
Number of Distinct Detects	48	Number of Distinct Non-Detects	8
Minimum Detect	0.043	Minimum Non-Detect	0.34
Maximum Detect	420	Maximum Non-Detect	0.41
Variance Detects	5648	Percent Non-Detects	20.59%
Mean Detects	16.48	SD Detects	75.15
Median Detects	0.645	CV Detects	4.56
Skewness Detects	5.064	Kurtosis Detects	24.73
Mean of Logged Detects	-0.109	SD of Logged Detects	1.886

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.227	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.489	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.12	Detected Data Not Normal at 5% Significance Level
Detected Data Not Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	13.12	KM Standard Error of Mean	8.162
KM SD	66.68	95% KM (BCA) UCL	29.76
95% KM (t) UCL	26.74	95% KM (Percentile Bootstrap) UCL	26.12
95% KM (z) UCL	26.55	95% KM Bootstrap t UCL	322.2
90% KM Chebyshev UCL	37.61	95% KM Chebyshev UCL	48.7
97.5% KM Chebyshev UCL	64.09	99% KM Chebyshev UCL	94.33

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	8.59	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.89	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.303	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.133	Detected Data Not Gamma Distributed at 5% Significance Level
Detected Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.245	k star (bias corrected MLE)	0.244
Theta hat (MLE)	67.33	Theta star (bias corrected MLE)	67.67
nu hat (MLE)	26.44	nu star (bias corrected)	26.31
Mean (detects)	16.48		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	13.09
Maximum	420	Median	0.475
SD	67.18	CV	5.132
k hat (MLE)	0.204	k star (bias corrected MLE)	0.204
Theta hat (MLE)	64.33	Theta star (bias corrected MLE)	64.07
nu hat (MLE)	27.68	nu star (bias corrected)	27.79
Adjusted Level of Significance (β)	0.0465		
Approximate Chi Square Value (27.79, α)	16.76	Adjusted Chi Square Value (27.79, β)	16.58
95% Gamma Approximate UCL (use when n>=50)	21.7	95% Gamma Adjusted UCL (use when n<50)	21.94

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	13.12	SD (KM)	66.68
Variance (KM)	4446	SE of Mean (KM)	8.162
k hat (KM)	0.0387	k star (KM)	0.0468
nu hat (KM)	5.268	nu star (KM)	6.369
theta hat (KM)	338.8	theta star (KM)	280.2
80% gamma percentile (KM)	1.399	90% gamma percentile (KM)	18.31
95% gamma percentile (KM)	68.04	99% gamma percentile (KM)	292.8

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (6.37, α)	1.831	Adjusted Chi Square Value (6.37, β)	1.779
95% Gamma Approximate KM-UCL (use when n>=50)	45.64	95% Gamma Adjusted KM-UCL (use when n<50)	46.97

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Approximate Test Statistic	0.923	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.00198	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.102	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.12	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Approximate Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	13.12	Mean in Log Scale	-0.52
SD in Original Scale	67.17	SD in Log Scale	1.877
95% t UCL (assumes normality of ROS data)	26.7	95% Percentile Bootstrap UCL	26.05
95% BCA Bootstrap UCL	34.94	95% Bootstrap t UCL	309.6
95% H-UCL (Log ROS)	6.578		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.502	KM Geo Mean	0.605
KM SD (logged)	1.859	95% Critical H Value (KM-Log)	2.775
KM Standard Error of Mean (logged)	0.233	95% H-UCL (KM -Log)	6.397
KM SD (logged)	1.859	95% Critical H Value (KM-Log)	2.775
KM Standard Error of Mean (logged)	0.233		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	13.13	Mean in Log Scale	-0.434
SD in Original Scale	67.17	SD in Log Scale	1.797
95% t UCL (Assumes normality)	26.71	95% H-Stat UCL	5.89
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use			
KM H-UCL	6.397		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Carbazole

General Statistics

Total Number of Observations	68	Number of Distinct Observations	39
		Number of Missing Observations	1
Number of Detects	10	Number of Non-Detects	58
Number of Distinct Detects	10	Number of Distinct Non-Detects	30
Minimum Detect	0.0017	Minimum Non-Detect	0.0069
Maximum Detect	0.055	Maximum Non-Detect	0.21
Variance Detects	2.6998E-4	Percent Non-Detects	85.29%
Mean Detects	0.0086	SD Detects	0.0164
Median Detects	0.00295	CV Detects	1.911
Skewness Detects	3.074	Kurtosis Detects	9.573
Mean of Logged Detects	-5.525	SD of Logged Detects	1.057

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.467	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.412	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00378	KM Standard Error of Mean	9.5294E-4
KM SD	0.00653	95% KM (BCA) UCL	0.00531
95% KM (t) UCL	0.00536	95% KM (Percentile Bootstrap) UCL	0.00537
95% KM (z) UCL	0.00534	95% KM Bootstrap t UCL	0.00756
90% KM Chebyshev UCL	0.00663	95% KM Chebyshev UCL	0.00793
97.5% KM Chebyshev UCL	0.00973	99% KM Chebyshev UCL	0.0133

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.494	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.756	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.299	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.276	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.775	k star (bias corrected MLE)	0.609
Theta hat (MLE)	0.0111	Theta star (bias corrected MLE)	0.0141
nu hat (MLE)	15.5	nu star (bias corrected)	12.18
Mean (detects)	0.0086		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0017	Mean	0.00979
Maximum	0.055	Median	0.01
SD	0.00604	CV	0.617
k hat (MLE)	4.527	k star (bias corrected MLE)	4.337
Theta hat (MLE)	0.00216	Theta star (bias corrected MLE)	0.00226
nu hat (MLE)	615.6	nu star (bias corrected)	589.8
Adjusted Level of Significance (β)	0.0465		
Approximate Chi Square Value (589.80, α)	534.5	Adjusted Chi Square Value (589.80, β)	533.3
95% Gamma Approximate UCL (use when n>=50)	0.0108	95% Gamma Adjusted UCL (use when n<50)	0.0108

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00378	SD (KM)	0.00653
Variance (KM)	4.2585E-5	SE of Mean (KM)	9.5294E-4
k hat (KM)	0.335	k star (KM)	0.33
nu hat (KM)	45.52	nu star (KM)	44.84
theta hat (KM)	0.0113	theta star (KM)	0.0114
80% gamma percentile (KM)	0.00591	90% gamma percentile (KM)	0.011
95% gamma percentile (KM)	0.0167	99% gamma percentile (KM)	0.0315

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (44.84, α)	30.48	Adjusted Chi Square Value (44.84, β)	30.23
95% Gamma Approximate KM-UCL (use when n>=50)	0.00555	95% Gamma Adjusted KM-UCL (use when n<50)	0.0056

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.782	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.228	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00384	Mean in Log Scale	-5.824
SD in Original Scale	0.00643	SD in Log Scale	0.54
95% t UCL (assumes normality of ROS data)	0.00514	95% Percentile Bootstrap UCL	0.00536
95% BCA Bootstrap UCL	0.00618	95% Bootstrap t UCL	0.00898
95% H-UCL (Log ROS)	0.00388		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.87	KM Geo Mean	0.00282
KM SD (logged)	0.564	95% Critical H Value (KM-Log)	1.912
KM Standard Error of Mean (logged)	0.153	95% H-UCL (KM -Log)	0.00378
KM SD (logged)	0.564	95% Critical H Value (KM-Log)	1.912
KM Standard Error of Mean (logged)	0.153		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0104	Mean in Log Scale	-5.122
SD in Original Scale	0.0178	SD in Log Scale	0.888
95% t UCL (Assumes normality)	0.014	95% H-Stat UCL	0.0112

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.00378		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chloride

General Statistics			
Total Number of Observations	68	Number of Distinct Observations	27
		Number of Missing Observations	1
Number of Detects	19	Number of Non-Detects	49
Number of Distinct Detects	18	Number of Distinct Non-Detects	12
Minimum Detect	4.1	Minimum Non-Detect	10
Maximum Detect	44	Maximum Non-Detect	25
Variance Detects	84.31	Percent Non-Detects	72.06%
Mean Detects	9.989	SD Detects	9.182
Median Detects	6.9	CV Detects	0.919
Skewness Detects	3.158	Kurtosis Detects	11.19
Mean of Logged Detects	2.087	SD of Logged Detects	0.591

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.594	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.293	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.197	Detected Data Not Normal at 5% Significance Level
Detected Data Not Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	7.537	KM Standard Error of Mean	0.758
KM SD	5.224	95% KM (BCA) UCL	8.92
95% KM (t) UCL	8.801	95% KM (Percentile Bootstrap) UCL	8.796
95% KM (z) UCL	8.784	95% KM Bootstrap t UCL	9.382
90% KM Chebyshev UCL	9.812	95% KM Chebyshev UCL	10.84
97.5% KM Chebyshev UCL	12.27	99% KM Chebyshev UCL	15.08

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	1.398	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.75	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.238	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.2	Detected Data Not Gamma Distributed at 5% Significance Level
Detected Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	2.482	k star (bias corrected MLE)	2.125
Theta hat (MLE)	4.025	Theta star (bias corrected MLE)	4.701
nu hat (MLE)	94.3	nu star (bias corrected)	80.74
Mean (detects)	9.989		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.18	Mean	7.507
Maximum	44	Median	6.404
SD	5.883	CV	0.784
k hat (MLE)	2.226	k star (bias corrected MLE)	2.137
Theta hat (MLE)	3.373	Theta star (bias corrected MLE)	3.513
nu hat (MLE)	302.7	nu star (bias corrected)	290.7
Adjusted Level of Significance (β)	0.0465		
Approximate Chi Square Value (290.66, α)	252.2	Adjusted Chi Square Value (290.66, β)	251.4
95% Gamma Approximate UCL (use when n>=50)	8.653	95% Gamma Adjusted UCL (use when n<50)	8.679

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	7.537	SD (KM)	5.224
Variance (KM)	27.29	SE of Mean (KM)	0.758
k hat (KM)	2.082	k star (KM)	2
nu hat (KM)	283.1	nu star (KM)	271.9
theta hat (KM)	3.621	theta star (KM)	3.769
80% gamma percentile (KM)	11.28	90% gamma percentile (KM)	14.66
95% gamma percentile (KM)	17.88	99% gamma percentile (KM)	25.02

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (271.95, α)	234.8	Adjusted Chi Square Value (271.95, β)	234
95% Gamma Approximate KM-UCL (use when n>=50)	8.731	95% Gamma Adjusted KM-UCL (use when n<50)	8.758

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.197	Detected Data Not Lognormal at 5% Significance Level
Detected Data Not Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	7.781	Mean in Log Scale	1.938
SD in Original Scale	5.326	SD in Log Scale	0.431
95% t UCL (assumes normality of ROS data)	8.859	95% Percentile Bootstrap UCL	8.908
95% BCA Bootstrap UCL	9.397	95% Bootstrap t UCL	9.684
95% H-UCL (Log ROS)	8.388		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.914	KM Geo Mean	6.778
KM SD (logged)	0.397	95% Critical H Value (KM-Log)	1.806
KM Standard Error of Mean (logged)	0.0758	95% H-UCL (KM -Log)	8.003
KM SD (logged)	0.397	95% Critical H Value (KM-Log)	1.806
KM Standard Error of Mean (logged)	0.0758		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	7.416	Mean in Log Scale	1.901
SD in Original Scale	5.257	SD in Log Scale	0.383
95% t UCL (Assumes normality)	8.48	95% H-Stat UCL	7.832
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use			
95% KM (Chebyshev) UCL	10.84		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chromium, Hexavalent

General Statistics

Total Number of Observations	58	Number of Distinct Observations	49
		Number of Missing Observations	1
Number of Detects	54	Number of Non-Detects	4
Number of Distinct Detects	47	Number of Distinct Non-Detects	3
Minimum Detect	0.18	Minimum Non-Detect	0.44
Maximum Detect	20.8	Maximum Non-Detect	0.49
Variance Detects	11.75	Percent Non-Detects	6.897%
Mean Detects	2.761	SD Detects	3.427
Median Detects	1.3	CV Detects	1.241
Skewness Detects	3.161	Kurtosis Detects	13.85
Mean of Logged Detects	0.476	SD of Logged Detects	1.036

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.681	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	1.543E-14	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.12	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.591	KM Standard Error of Mean	0.442
KM SD	3.335	95% KM (BCA) UCL	3.406
95% KM (t) UCL	3.331	95% KM (Percentile Bootstrap) UCL	3.35
95% KM (z) UCL	3.319	95% KM Bootstrap t UCL	3.67
90% KM Chebyshev UCL	3.918	95% KM Chebyshev UCL	4.518
97.5% KM Chebyshev UCL	5.352	99% KM Chebyshev UCL	6.99

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.514	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.778	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.159	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.124	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.062	k star (bias corrected MLE)	1.015
Theta hat (MLE)	2.601	Theta star (bias corrected MLE)	2.72
nu hat (MLE)	114.6	nu star (bias corrected)	109.6
Mean (detects)	2.761		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.571
Maximum	20.8	Median	1.15
SD	3.379	CV	1.314
k hat (MLE)	0.733	k star (bias corrected MLE)	0.707
Theta hat (MLE)	3.508	Theta star (bias corrected MLE)	3.639
nu hat (MLE)	85.03	nu star (bias corrected)	81.97
Adjusted Level of Significance (β)	0.0459		
Approximate Chi Square Value (81.97, α)	62.1	Adjusted Chi Square Value (81.97, β)	61.66
95% Gamma Approximate UCL (use when n>=50)	3.394	95% Gamma Adjusted UCL (use when n<50)	3.418

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.591	SD (KM)	3.335
Variance (KM)	11.12	SE of Mean (KM)	0.442
k hat (KM)	0.604	k star (KM)	0.584
nu hat (KM)	70.03	nu star (KM)	67.74
theta hat (KM)	4.292	theta star (KM)	4.438
80% gamma percentile (KM)	4.271	90% gamma percentile (KM)	6.781
95% gamma percentile (KM)	9.416	99% gamma percentile (KM)	15.81

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (67.74, α)	49.8	Adjusted Chi Square Value (67.74, β)	49.41
95% Gamma Approximate KM-UCL (use when n>=50)	3.525	95% Gamma Adjusted KM-UCL (use when n<50)	3.553

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.965	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.21	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.121	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.12	Detected Data Not Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.588	Mean in Log Scale	0.347
SD in Original Scale	3.367	SD in Log Scale	1.108
95% t UCL (assumes normality of ROS data)	3.327	95% Percentile Bootstrap UCL	3.367
95% BCA Bootstrap UCL	3.509	95% Bootstrap t UCL	3.699
95% H-UCL (Log ROS)	3.777		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.358	KM Geo Mean	1.43
KM SD (logged)	1.084	95% Critical H Value (KM-Log)	2.471
KM Standard Error of Mean (logged)	0.144	95% H-UCL (KM -Log)	3.669
KM SD (logged)	1.084	95% Critical H Value (KM-Log)	2.471
KM Standard Error of Mean (logged)	0.144		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.586	Mean in Log Scale	0.342
SD in Original Scale	3.368	SD in Log Scale	1.116
95% t UCL (Assumes normality)	3.326	95% H-Stat UCL	3.808

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	3.669		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Nickel

General Statistics			
Total Number of Observations	68	Number of Distinct Observations	46
		Number of Missing Observations	1
Minimum	2.5	Mean	11.55
Maximum	40	Median	9.55
SD	7.043	Std. Error of Mean	0.854
Coefficient of Variation	0.61	Skewness	1.944

Normal GOF Test		
Shapiro Wilk Test Statistic	0.81	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	7.305E-12	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.237	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.107	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	12.97	95% Adjusted-CLT UCL (Chen-1995)	13.17
		95% Modified-t UCL (Johnson-1978)	13.01

Gamma GOF Test		
A-D Test Statistic	1.583	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.756	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.172	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.109	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	3.637	k star (bias corrected MLE)	3.486
Theta hat (MLE)	3.176	Theta star (bias corrected MLE)	3.313
nu hat (MLE)	494.6	nu star (bias corrected)	474.1
MLE Mean (bias corrected)	11.55	MLE Sd (bias corrected)	6.186
		Approximate Chi Square Value (0.05)	424.6
Adjusted Level of Significance	0.0465	Adjusted Chi Square Value	423.6

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	12.9	95% Adjusted Gamma UCL (use when n<50)	12.93

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0.355	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.134	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.107	Data Not Lognormal at 5% Significance Level
Data appear Approximate Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	0.916	Mean of logged Data	2.303
Maximum of Logged Data	3.689	SD of logged Data	0.525

Assuming Lognormal Distribution			
95% H-UCL	12.95	90% Chebyshev (MVUE) UCL	13.77
95% Chebyshev (MVUE) UCL	14.81	97.5% Chebyshev (MVUE) UCL	16.27
99% Chebyshev (MVUE) UCL	19.13		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	12.95	95% Jackknife UCL	12.97
95% Standard Bootstrap UCL	12.91	95% Bootstrap-t UCL	13.25
95% Hall's Bootstrap UCL	13.3	95% Percentile Bootstrap UCL	12.96
95% BCA Bootstrap UCL	13.08		
90% Chebyshev(Mean, Sd) UCL	14.11	95% Chebyshev(Mean, Sd) UCL	15.27
97.5% Chebyshev(Mean, Sd) UCL	16.88	99% Chebyshev(Mean, Sd) UCL	20.05

Suggested UCL to Use			
95% H-UCL	12.95		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Sulfate

General Statistics			
Total Number of Observations	68	Number of Distinct Observations	51
		Number of Missing Observations	1
Minimum	12	Mean	2994
Maximum	18000	Median	615
SD	4785	Std. Error of Mean	580.2
Coefficient of Variation	1.598	Skewness	1.921

Normal GOF Test		
Shapiro Wilk Test Statistic	0.65	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.285	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.107	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	3962	95% Adjusted-CLT UCL (Chen-1995)	4093
		95% Modified-t UCL (Johnson-1978)	3985

Gamma GOF Test		
A-D Test Statistic	2.52	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.825	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.146	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.115	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	0.466	k star (bias corrected MLE)	0.455
Theta hat (MLE)	6428	Theta star (bias corrected MLE)	6580
nu hat (MLE)	63.35	nu star (bias corrected)	61.89
MLE Mean (bias corrected)	2994	MLE Sd (bias corrected)	4439
		Approximate Chi Square Value (0.05)	44.79
Adjusted Level of Significance	0.0465	Adjusted Chi Square Value	44.48

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	4137	95% Adjusted Gamma UCL (use when n<50)	4166

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.947	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0.012	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.13	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.107	Data Not Lognormal at 5% Significance Level
Data Not Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	2.485	Mean of logged Data	6.626
Maximum of Logged Data	9.798	SD of logged Data	1.811

Assuming Lognormal Distribution			
95% H-UCL	7086	90% Chebyshev (MVUE) UCL	7179
95% Chebyshev (MVUE) UCL	8773	97.5% Chebyshev (MVUE) UCL	10986
99% Chebyshev (MVUE) UCL	15333		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs			
95% CLT UCL	3949	95% Jackknife UCL	3962
95% Standard Bootstrap UCL	3933	95% Bootstrap-t UCL	4098
95% Hall's Bootstrap UCL	4078	95% Percentile Bootstrap UCL	3998
95% BCA Bootstrap UCL	4080		
90% Chebyshev(Mean, Sd) UCL	4735	95% Chebyshev(Mean, Sd) UCL	5524
97.5% Chebyshev(Mean, Sd) UCL	6618	99% Chebyshev(Mean, Sd) UCL	8768

Suggested UCL to Use			
95% Chebyshev (Mean, Sd) UCL	5524		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Attachment C

TABLE C-1
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - FUTURE - OUTDOOR WORKER - ADULT - 0-2FT
HUMAN HEALTH RISK ASSESSMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

SCENARIO TIMEFRAME: FUTURE
RECEPTOR POPULATION: OUTDOOR WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	CONTAINMENT AREA	INGESTION	4-Chlorophenyl phenyl ether	0.031	mg/kg	9.7E-09	mg/kg/day	8.0E-03	(mg/kg/day)-1	8.E-11	2.7E-08	mg/kg/day	5.0E-01	mg/kg/day	5.E-08
				Carbazole	0.0035	mg/kg	1.1E-09	mg/kg/day	2.0E-02	(mg/kg/day)-1	2.E-11	3.1E-09	mg/kg/day	NA		
				Arsenic	14.07	mg/kg	2.7E-06	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-06	7.4E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Nickel	10.55	mg/kg	3.3E-06	mg/kg/day	9.1E-01	(mg/kg/day)-1	3.E-06	9.3E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-04
				Ammonia	13.34	mg/kg	NC		NC			1.2E-05	mg/kg/day	NA		
			EXPOSURE ROUTE TOTAL								7.E-06					3.E-02
			DERMAL	4-Chlorophenyl phenyl ether	0.031	mg/kg	6.4E-08	mg/kg/day	8.0E-03	(mg/kg/day)-1	5.E-10	1.8E-07	mg/kg/day	5.0E-01	mg/kg/day	4.E-07
				Carbazole	0.0035	mg/kg	7.3E-10	mg/kg/day	2.0E-02	(mg/kg/day)-1	1.E-11	2.0E-09	mg/kg/day	NA		
				Arsenic	14.07	mg/kg	8.8E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-06	2.5E-06	mg/kg/day	3.0E-04	mg/kg/day	8.E-03
				Nickel	10.55	mg/kg	--		9.1E-01	(mg/kg/day)-1		--		8.0E-04	mg/kg/day	
				Ammonia	13.34	mg/kg	NC		NC			--		NA		
			EXPOSURE ROUTE TOTAL								1.E-06					8.E-03
		EXPOSURE POINT TOTAL									8.E-06					3.E-02
	EXPOSURE MEDIUM TOTAL										8.E-06					3.E-02
	AIR	DUST AT CONTAINMENT AREA	DUST INHALATION	4-Chlorophenyl phenyl ether	0.031	mg/kg	NC		NC			4.7E-09	ug/m3	4.0E-01	ug/m3	1.E-08
				Carbazole	0.0035	mg/kg	NC		NC			5.3E-10	ug/m3	NA		
				Arsenic	14.07	mg/kg	7.6E-07	ug/m3	4.3E-03	(ug/m3)-1	3.E-09	2.1E-06	ug/m3	1.5E-02	ug/m3	1.E-04
				Nickel	10.55	mg/kg	5.7E-07	ug/m3	2.6E-04	(ug/m3)-1	1.E-10	1.6E-06	ug/m3	9.0E-02	ug/m3	2.E-05
				Ammonia	13.34	mg/kg	NC		NC			2.0E-06	ug/m3	1.0E+02	ug/m3	2.E-08
			EXPOSURE ROUTE TOTAL								3.E-09					2.E-04
		EXPOSURE POINT TOTAL									3.E-09					2.E-04
	EXPOSURE MEDIUM TOTAL										3.E-09					2.E-04
SOIL TOTAL											**8.E-06**					**3.E-02**
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	**8.E-06**	**TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA**				**3.E-02**

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
NV - Not volatile; exposure route not complete for this chemical.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: CF 5/28/2020
Checked by: JPK 5/28/2020

TABLE C-2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - FUTURE - OUTDOOR WORKER - ADULT - 0-2FT
HUMAN HEALTH RISK ASSESSMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

SCENARIO TIMEFRAME: FUTURE
RECEPTOR POPULATION: OUTDOOR WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	CONTAINMENT AREA	4-Chlorophenyl phenyl ether	7.8E-11	NA	5.1E-10	NA	5.9E-10	Kidney	5.5E-08	NA	3.6E-07	4.1E-07
			Carbazole	2.2E-11	NA	1.5E-11	NA	3.7E-11		--	NA	--	
			Arsenic	4.0E-06	NA	1.3E-06	NA	5.3E-06	Skin / Cardiovascular	2.5E-02	NA	8.2E-03	3.3E-02
			Nickel	3.0E-06	NA	--	NA	3.0E-06	General Toxicity	4.6E-04	NA	--	4.6E-04
			Ammonia	NC	NA	NC	NA			--	NA	--	
			CHEMICAL TOTAL	7.0E-06	--	1.3E-06	--	8E-06		2.5E-02	--	8.2E-03	3E-02
		EXPOSURE POINT TOTAL						8E-06					3E-02
	EXPOSURE MEDIUM TOTAL							8E-06					3E-02
SOIL	AIR	DUST AT CONTAINMENT AREA	4-Chlorophenyl phenyl ether	NA	NC	NA	NA		Respiratory	NA	1.2E-08	NA	1.2E-08
			Carbazole	NA	NC	NA	NA			NA	--	NA	
			Arsenic	NA	3.3E-09	NA	NA	3.3E-09	Developmental /	NA	1.4E-04	NA	1.4E-04
			Nickel	NA	1.5E-10	NA	NA	1.5E-10	Respiratory	NA	1.8E-05	NA	1.8E-05
			Ammonia	NA	NC	NA	NA		Respiratory	NA	2.0E-08	NA	2.0E-08
			CHEMICAL TOTAL	--	3.4E-09	--	--	3E-09		--	1.6E-04	--	2E-04
		EXPOSURE POINT TOTAL						3E-09					2E-04
	EXPOSURE MEDIUM TOTAL							3E-09					2E-04
SOIL TOTAL								**8E-06**					**3E-02**
RECEPTOR TOTAL								**8E-06**					**3E-02**
							TOTAL RISK ACROSS ALL MEDIA	**8E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**3E-02**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: CF 5/28/2020
Checked by: JPK 5/28/2020

TOTAL GENERAL TOXICITY HI =	**4.6E-04**
TOTAL CARDIOVASCULAR HI =	**1.4E-04**
TOTAL DEVELOPMENTAL HI =	**1.4E-04**
	--
	--
	--
	--
	--
TOTAL KIDNEY HI =	**4.1E-07**
	--
	--
TOTAL NERVOUS SYSTEM HI =	**1.4E-04**
	--
	--
	--
TOTAL RESPIRATORY HI =	**1.8E-05**

TABLE C-3
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - FUTURE - OUTDOOR WORKER - ADULT - 2-10FT
HUMAN HEALTH RISK ASSESSMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

SCENARIO TIMEFRAME: FUTURE
RECEPTOR POPULATION: OUTDOOR WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	CONTAINMENT AREA	INGESTION	4-Bromophenyl phenyl ether	0.19	mg/kg	6.0E-08	mg/kg/day	8.0E-03	(mg/kg/day)-1	5.E-10	1.7E-07	mg/kg/day	5.0E-01	mg/kg/day	3.E-07
				4-Chlorophenyl phenyl ether	0.0064	mg/kg	2.0E-09	mg/kg/day	8.0E-03	(mg/kg/day)-1	2.E-11	5.6E-09	mg/kg/day	5.0E-01	mg/kg/day	1.E-08
				Bis(2-Ethylhexyl)phthalate	91.93	mg/kg	2.9E-05	mg/kg/day	1.4E-02	(mg/kg/day)-1	4.E-07	8.1E-05	mg/kg/day	2.0E-02	mg/kg/day	4.E-03
				Carbazole	0.00717	mg/kg	2.3E-09	mg/kg/day	2.0E-02	(mg/kg/day)-1	5.E-11	6.3E-09	mg/kg/day	NA		
				Arsenic	8.681	mg/kg	1.6E-06	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-06	4.6E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Chromium, Hexavalent	3.339	mg/kg	1.1E-06	mg/kg/day	5.0E-01	(mg/kg/day)-1	5.E-07	2.9E-06	mg/kg/day	3.0E-03	mg/kg/day	1.E-03
				Nickel	14.58	mg/kg	4.6E-06	mg/kg/day	9.1E-01	(mg/kg/day)-1	4.E-06	1.3E-05	mg/kg/day	2.0E-02	mg/kg/day	6.E-04
				Ammonia	21.28	mg/kg	NC		NC			1.9E-05	mg/kg/day	NA		
			EXPOSURE ROUTE TOTAL								8.E-06					2.E-02
			DERMAL	4-Bromophenyl phenyl ether	0.19	mg/kg	3.9E-07	mg/kg/day	8.0E-03	(mg/kg/day)-1	3.E-09	1.1E-06	mg/kg/day	5.0E-01	mg/kg/day	2.E-06
				4-Chlorophenyl phenyl ether	0.0064	mg/kg	1.3E-08	mg/kg/day	8.0E-03	(mg/kg/day)-1	1.E-10	3.7E-08	mg/kg/day	5.0E-01	mg/kg/day	7.E-08
				Bis(2-Ethylhexyl)phthalate	91.93	mg/kg	1.9E-05	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-07	5.3E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Carbazole	0.00717	mg/kg	1.5E-09	mg/kg/day	2.0E-02	(mg/kg/day)-1	3.E-11	4.2E-09	mg/kg/day	NA		
				Arsenic	8.681	mg/kg	5.4E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-07	1.5E-06	mg/kg/day	3.0E-04	mg/kg/day	5.E-03
				Chromium, Hexavalent	3.339	mg/kg	--		5.0E-01	(mg/kg/day)-1		--		7.5E-05	mg/kg/day	
				Nickel	14.58	mg/kg	--		9.1E-01	(mg/kg/day)-1		--		8.0E-04	mg/kg/day	
				Ammonia	21.28	mg/kg	NC		NC			--		NA		
			EXPOSURE ROUTE TOTAL								1.E-06					8.E-03
		EXPOSURE POINT TOTAL									9.E-06					3.E-02
	EXPOSURE MEDIUM TOTAL										9.E-06					3.E-02
	AIR	DUST AT CONTAINMENT AREA	DUST INHALATION	4-Bromophenyl phenyl ether	0.19	mg/kg	NC		NC			2.9E-08	ug/m3	4.0E-01	ug/m3	7.E-08
				4-Chlorophenyl phenyl ether	0.0064	mg/kg	NC		NC			9.7E-10	ug/m3	4.0E-01	ug/m3	2.E-09
				Bis(2-Ethylhexyl)phthalate	91.93	mg/kg	5.0E-06	ug/m3	2.4E-06	(ug/m3)-1	1.E-11	1.4E-05	ug/m3	ND		
				Carbazole	0.00717	mg/kg	NC		NC			1.1E-09	ug/m3	NA		
				Arsenic	8.681	mg/kg	4.7E-07	ug/m3	4.3E-03	(ug/m3)-1	2.E-09	1.3E-06	ug/m3	1.5E-02	ug/m3	9.E-05
				Chromium, Hexavalent	3.339	mg/kg	1.8E-07	ug/m3	8.4E-02	(ug/m3)-1	2.E-08	5.0E-07	ug/m3	1.0E-01	ug/m3	5.E-06
				Nickel	14.58	mg/kg	7.9E-07	ug/m3	2.6E-04	(ug/m3)-1	2.E-10	2.2E-06	ug/m3	9.0E-02	ug/m3	2.E-05
				Ammonia	21.28	mg/kg	NC		NC			3.2E-06	ug/m3	1.0E+02	ug/m3	3.E-08
			EXPOSURE ROUTE TOTAL								2.E-08					1.E-04
		EXPOSURE POINT TOTAL									2.E-08					1.E-04
	EXPOSURE MEDIUM TOTAL										2.E-08					1.E-04
SOIL TOTAL											**9.E-06**					**3.E-02**
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	**9.E-06**	**TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA**				**3.E-02**

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
NV - Not volatile; exposure route not complete for this chemical.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: CF 5/28/2020
Checked by: JPK 5/28/2020

TABLE C-4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - FUTURE - OUTDOOR WORKER - ADULT - 2-10FT
HUMAN HEALTH RISK ASSESSMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

SCENARIO TIMEFRAME: FUTURE
RECEPTOR POPULATION: OUTDOOR WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	CONTAINMENT AREA	4-Bromophenyl phenyl ether	4.8E-10	NA	3.2E-09	NA	3.6E-09	Kidney	3.3E-07	NA	2.2E-06	2.5E-06
			4-Chlorophenyl phenyl ether	1.6E-11	NA	1.1E-10	NA	1.2E-10	Kidney	1.1E-08	NA	7.4E-08	8.6E-08
			Bis(2-Ethylhexyl)phthalate	4.0E-07	NA	2.7E-07	NA	6.7E-07	Liver	4.0E-03	NA	2.7E-03	6.7E-03
			Carbazole	4.5E-11	NA	3.0E-11	NA	7.5E-11		--	NA	--	
			Arsenic	2.5E-06	NA	8.1E-07	NA	3.3E-06	Skin / Cardiovascular	1.5E-02	NA	5.0E-03	2.0E-02
			Chromium, Hexavalent	5.3E-07	NA	--	NA	5.3E-07	Undetermined	9.8E-04	NA	--	9.8E-04
			Nickel	4.2E-06	NA	--	NA	4.2E-06	General Toxicity	6.4E-04	NA	--	6.4E-04
			Ammonia	NC	NA	NC	NA			--	NA	--	
			CHEMICAL TOTAL	7.6E-06	--	1.1E-06	--	9E-06		2.1E-02	--	7.7E-03	3E-02
		EXPOSURE POINT TOTAL						9E-06					3E-02
	EXPOSURE MEDIUM TOTAL							9E-06					3E-02
SOIL	AIR	DUST AT CONTAINMENT AREA	4-Bromophenyl phenyl ether	NA	NC	NA	NA			NA	7.2E-08	NA	7.2E-08
			4-Chlorophenyl phenyl ether	NA	NC	NA	NA		Respiratory	NA	2.4E-09	NA	2.4E-09
			Bis(2-Ethylhexyl)phthalate	NA	1.2E-11	NA	NA	1.2E-11		NA	--	NA	
			Carbazole	NA	NC	NA	NA			NA	--	NA	
			Arsenic	NA	2.0E-09	NA	NA	2.0E-09	Developmental /	NA	8.7E-05	NA	8.7E-05
			Chromium, Hexavalent	NA	1.5E-08	NA	NA	1.5E-08	Respiratory	NA	5.0E-06	NA	5.0E-06
			Nickel	NA	2.0E-10	NA	NA	2.0E-10	Respiratory	NA	2.4E-05	NA	2.4E-05
			Ammonia	NA	NC	NA	NA		Respiratory	NA	3.2E-08	NA	3.2E-08
			CHEMICAL TOTAL	--	1.7E-08	--	--	2E-08		--	1.2E-04	--	1E-04
		EXPOSURE POINT TOTAL						2E-08					1E-04
	EXPOSURE MEDIUM TOTAL							2E-08					1E-04
SOIL TOTAL								**9E-06**					**3E-02**
RECEPTOR TOTAL								**9E-06**					**3E-02**
							TOTAL RISK ACROSS ALL MEDIA	**9E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**3E-02**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: CF 5/28/2020
Checked by: JPK 5/28/2020

TOTAL GENERAL TOXICITY HI =	**6.4E-04**
TOTAL CARDIOVASCULAR HI =	**8.7E-05**
TOTAL DEVELOPMENTAL HI =	**8.7E-05**
	--
	--
	--
	--
	--
TOTAL KIDNEY HI =	**2.6E-06**
TOTAL LIVER HI =	**6.7E-03**
	--
TOTAL NERVOUS SYSTEM HI =	**8.7E-05**
TOTAL NOAEL HI =	**9.8E-04**
	--
	--
TOTAL RESPIRATORY HI =	**3.0E-05**

TABLE C-5
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - FUTURE - CONSTRUCTION WORKER - ADULT - 0-10FT
HUMAN HEALTH RISK ASSESSMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

SCENARIO TIMEFRAME: FUTURE
RECEPTOR POPULATION: CONSTRUCTION WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	CONTAINMENT AREA	INGESTION	4-Bromophenyl phenyl ether	0.19	mg/kg	8.8E-09	mg/kg/day	8.0E-03	(mg/kg/day)-1	7.E-11	6.1E-07	mg/kg/day	1.0E-01	mg/kg/day	6.E-06
				4-Chlorophenyl phenyl ether	0.031	mg/kg	1.4E-09	mg/kg/day	8.0E-03	(mg/kg/day)-1	1.E-11	1.0E-07	mg/kg/day	1.0E-01	mg/kg/day	1.E-06
				Bis(2-Ethylhexyl)phthalate	6.397	mg/kg	3.0E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	4.E-09	2.1E-05	mg/kg/day	2.0E-02	mg/kg/day	1.E-03
				Carbazole	0.00378	mg/kg	1.7E-10	mg/kg/day	2.0E-02	(mg/kg/day)-1	3.E-12	1.2E-08	mg/kg/day	NA		
				Arsenic	9.765	mg/kg	2.7E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-07	1.9E-05	mg/kg/day	5.0E-03	mg/kg/day	4.E-03
				Chromium, Hexavalent	3.669	mg/kg	1.7E-07	mg/kg/day	5.0E-01	(mg/kg/day)-1	8.E-08	1.2E-05	mg/kg/day	3.0E-03	mg/kg/day	4.E-03
				Nickel	12.95	mg/kg	6.0E-07	mg/kg/day	9.1E-01	(mg/kg/day)-1	5.E-07	4.2E-05	mg/kg/day	2.0E-02	mg/kg/day	2.E-03
				Ammonia	17.89	mg/kg	NC		NC			5.8E-05	mg/kg/day	NA		
			EXPOSURE ROUTE TOTAL								1.E-06					1.E-02
			DERMAL	4-Bromophenyl phenyl ether	0.19	mg/kg	2.6E-08	mg/kg/day	8.0E-03	(mg/kg/day)-1	2.E-10	1.8E-06	mg/kg/day	1.0E-01	mg/kg/day	2.E-05
				4-Chlorophenyl phenyl ether	0.031	mg/kg	4.3E-09	mg/kg/day	8.0E-03	(mg/kg/day)-1	3.E-11	3.0E-07	mg/kg/day	1.0E-01	mg/kg/day	3.E-06
				Bis(2-Ethylhexyl)phthalate	6.397	mg/kg	8.9E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-09	6.2E-06	mg/kg/day	2.0E-02	mg/kg/day	3.E-04
				Carbazole	0.00378	mg/kg	5.2E-11	mg/kg/day	2.0E-02	(mg/kg/day)-1	1.E-12	3.7E-09	mg/kg/day	NA		
				Arsenic	9.765	mg/kg	4.1E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-08	2.8E-06	mg/kg/day	5.0E-03	mg/kg/day	6.E-04
				Chromium, Hexavalent	3.669	mg/kg	--		5.0E-01	(mg/kg/day)-1		--		3.0E-03	mg/kg/day	
				Nickel	12.95	mg/kg	--		9.1E-01	(mg/kg/day)-1		--		2.0E-02	mg/kg/day	
				Ammonia	17.89	mg/kg	NC		NC			--		NA		
			EXPOSURE ROUTE TOTAL								6.E-08					9.E-04
		EXPOSURE POINT TOTAL									1.E-06					1.E-02
	EXPOSURE MEDIUM TOTAL										1.E-06					1.E-02
	AIR	DUST AT CONTAINMENT AREA	DUST INHALATION	4-Bromophenyl phenyl ether	0.19	mg/kg	NC		NC			2.8E-07	ug/m3	4.0E+00	ug/m3	7.E-08
				4-Chlorophenyl phenyl ether	0.031	mg/kg	NC		NC			4.5E-08	ug/m3	4.0E+00	ug/m3	1.E-08
				Bis(2-Ethylhexyl)phthalate	6.397	mg/kg	1.3E-07	ug/m3	2.4E-06	(ug/m3)-1	3.E-13	9.3E-06	ug/m3	ND		
				Carbazole	0.00378	mg/kg	NC		NC			5.5E-09	ug/m3	NA		
				Arsenic	9.765	mg/kg	2.0E-07	ug/m3	4.3E-03	(ug/m3)-1	9.E-10	1.4E-05	ug/m3	1.5E-02	ug/m3	9.E-04
				Chromium, Hexavalent	3.669	mg/kg	7.6E-08	ug/m3	8.4E-02	(ug/m3)-1	6.E-09	5.3E-06	ug/m3	3.0E-01	ug/m3	2.E-05
				Nickel	12.95	mg/kg	2.7E-07	ug/m3	2.6E-04	(ug/m3)-1	7.E-11	1.9E-05	ug/m3	2.0E-01	ug/m3	9.E-05
				Ammonia	17.89	mg/kg	NC		NC			2.6E-05	ug/m3	1.0E+02	ug/m3	3.E-07
			EXPOSURE ROUTE TOTAL								7.E-09					1.E-03
		EXPOSURE POINT TOTAL									7.E-09					1.E-03
	EXPOSURE MEDIUM TOTAL										7.E-09					1.E-03
SOIL TOTAL											**1.E-06**					**1.E-02**
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	**1.E-06**	**TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA**				**1.E-02**

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
NV - Not volatile; exposure route not complete for this chemical.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: CF 5/28/2020
Checked by: JPK 5/28/2020

TABLE C-6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - FUTURE - CONSTRUCTION WORKER - ADULT - 0-10FT
HUMAN HEALTH RISK ASSESSMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

SCENARIO TIMEFRAME: FUTURE
RECEPTOR POPULATION: CONSTRUCTION WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	CONTAINMENT AREA	4-Bromophenyl phenyl ether	7.0E-11	NA	2.1E-10	NA	2.8E-10	Developmental	6.1E-06	NA	1.8E-05	2.5E-05
			4-Chlorophenyl phenyl ether	1.1E-11	NA	3.4E-11	NA	4.6E-11	Kidney	1.0E-06	NA	3.0E-06	4.0E-06
			Bis(2-Ethylhexyl)phthalate	4.1E-09	NA	1.2E-09	NA	5.4E-09	Liver	1.0E-03	NA	3.1E-04	1.3E-03
			Carbazole	3.5E-12	NA	1.0E-12	NA	4.5E-12		--	NA	--	
			Arsenic	4.1E-07	NA	6.1E-08	NA	4.7E-07	GI System	3.8E-03	NA	5.7E-04	4.4E-03
			Chromium, Hexavalent	8.5E-08	NA	--	NA	8.5E-08	Undetermined	3.9E-03	NA	--	3.9E-03
			Nickel	5.4E-07	NA	--	NA	5.4E-07	General Toxicity	2.1E-03	NA	--	2.1E-03
			Ammonia	NC	NA	NC	NA			--	NA	--	
			CHEMICAL TOTAL	1.0E-06	--	6.2E-08	--	1E-06		1.1E-02	--	9.0E-04	1E-02
		EXPOSURE POINT TOTAL						1E-06					1E-02
	EXPOSURE MEDIUM TOTAL							1E-06					1E-02
SOIL	AIR	DUST AT CONTAINMENT AREA	4-Bromophenyl phenyl ether	NA	NC	NA	NA			NA	6.9E-08	NA	6.9E-08
			4-Chlorophenyl phenyl ether	NA	NC	NA	NA		Respiratory	NA	1.1E-08	NA	1.1E-08
			Bis(2-Ethylhexyl)phthalate	NA	3.2E-13	NA	NA	3.2E-13		NA	--	NA	
			Carbazole	NA	NC	NA	NA			NA	--	NA	
			Arsenic	NA	8.7E-10	NA	NA	8.7E-10	Developmental /	NA	9.5E-04	NA	9.5E-04
			Chromium, Hexavalent	NA	6.4E-09	NA	NA	6.4E-09	Respiratory	NA	1.8E-05	NA	1.8E-05
			Nickel	NA	7.0E-11	NA	NA	7.0E-11	Respiratory	NA	9.4E-05	NA	9.4E-05
			Ammonia	NA	NC	NA	NA		Respiratory	NA	2.6E-07	NA	2.6E-07
			CHEMICAL TOTAL	--	7.3E-09	--	--	7E-09		--	1.1E-03	--	1E-03
		EXPOSURE POINT TOTAL						7E-09					1E-03
	EXPOSURE MEDIUM TOTAL							7E-09					1E-03
SOIL TOTAL								**1E-06**					**1E-02**
RECEPTOR TOTAL								**1E-06**					**1E-02**
							TOTAL RISK ACROSS ALL MEDIA	**1E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**1E-02**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: CF 5/28/2020
Checked by: JPK 5/28/2020

TOTAL GENERAL TOXICITY HI =	**2.1E-03**
TOTAL CARDIOVASCULAR HI =	**9.5E-04**
TOTAL DEVELOPMENTAL HI =	**9.7E-04**
	--
	--
TOTAL GI SYSTEM HI =	**4.4E-03**
	--
	--
TOTAL KIDNEY HI =	**4.0E-06**
TOTAL LIVER HI =	**1.3E-03**
	--
TOTAL NERVOUS SYSTEM HI =	**9.5E-04**
TOTAL NOAEL HI =	**3.9E-03**
	--
	--
TOTAL RESPIRATORY HI =	**1.1E-04**